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ABSTRACT

Proceedings of a Florida statewide conference on quality in higher education are presented. Topics include the following: databases, the community colleges' accounting for quality, program budgeting, and trends in truth in testing. Transcripts of a panel discussion on databases and the following papers and reports are included: "Quality and the State Community College Coordinating Board," by Myron Blee: "Report of the Academic Quality Subcommittee: A Concept and Recommendations": "Program Mapping: Quality Control for Academic Programs," by Richard Bedics: "One Step Beyond," by Mantha Mehallis: "The Impact of Program Budgeting Upon Offices of Institutional Research in the SUS of Florida," by Albert Hartley: "Toward Principles of Postsecondary Education Funding," by Pat Barrett: "Reshaping the Dialogue," by Bill Shade: "Microcomputers: A Catalyst for the Identification and Improvement of Quality Instruction," by Al Mizell: "A Proposed Taxonomy of Educational Benefits," by Lester Ruth: "Essential Academic Skills Project: Progress Report," by Margaret Maney: "Bill Considered in 1980 Florida Legislative Session": "Should There Be Legislation to Regulate Testing?" by Thomas Redmon: "Technical Issues Associated With Legislation to Regulate Testing," by Margaret Weber: "An ACT Viewpoint on Testing Legislation," by Jim Carr: and "Some Facts About the Predictive Validity of the ACT Assessment," by James Maxey. (SW)

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PROCEEDINGS OF THE
THIRTEENTH
ANNUAL FLORIDA STATEWIDE CONFERENCE
ON
INSTITUTIONAL RESEARCH

Downtown Holiday Inn — June 11-13, 1980 — Tallahassee, Florida

Expectations for Quality: Should they be satisfied or questioned?

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Archie B. Johnston, Local Arrangements and Host

Julia Duckwall, Associate Editor

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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INTRODUCTION

Many of the issues relevant to the first Florida Institutional Research Conference are still concerns to the participants of the 13th Annual Conference. However, one word we are hearing more often in more settings is "quality." The theme of the past two years of legislative sessions has been that Florida has gone far enough in expanding the quantity in higher education and that it is time to work on the quality. There have been several conferences - - regional and national - - in the last year with higher education quality as the theme. In general, a lot of actions are now being taken in the name of quality.

Although there were only a few hours available for evaluation between the adjournment of the 1980 Florida Legislative Session and the opening of this conference, it appeared that legislative intention was to improve quality in the colleges and universities of the state. Likewise quality improvement has been the justification for a number of actions by the Community College Coordinating Board and by the Board of Regents of the State University System. In this setting, it was very timely to conduct this program. The question on the minds of many participants was, are current trends going to improve quality in Florida's higher education or not?

Any conference requires the assistance of many individuals. The work of some individuals is implied by the appearance of their names on the programs for the conference. In addition to that recognition, it is a pleasure to acknowledge here the assistance of them and many others. Archie Johnston, Tallahassee Community College, was local arrangements chairman and host. Julia Duckwall, FSU, served not only as recorder but as associate editor for these proceedings. The de facto Board of Advisors for the early stages of planning were Pete Tully, Craig Johnson, Sue Legg, Russ Peeples, Pat Howe, Bill Law, Norris Miner, and Archie Johnston. Bill Law, Gary Lott, and Myron Blee played a large part in determining the program for the conference. Pat Howe and Al Smith read the contributed papers. Norris Miner and Jim Talmedge deserve special recognition as keepers of the mailing list and the treasury. Expert typing of the proceedings was completed by Linda Slaven, and Jean Holzapfel prepared the final copy. Finally, special thanks go to the individuals named in the program who chaired the sessions.

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Data Bases: Compatible or Combatible

There has been increasing consideration of a uniform data base for all of Florida's Higher Education. What are the pluses and minuses? Are there alternative means to satisfy the objectives?

Chair: Bill Law, Staff Director, House Higher Education Committee

Bill Odom, Staff, Senate Ways and Means Committee

Jim Morgan, Director, Management Information Services, SUS

Dallas Fox, Associate Director, Planning and Analysis, UF

John Losak, Dean, Institutional Research, Miami-Dade Community College

Presentations of panelists

Bill Law:

Florida's state universities and community colleges have always struggled mightily to provide timely and useful information to state level questions and concerns posed by the executive and legislative branches of government. Despite the fact that very considerable effort has been undertaken, legislators have a feeling that the information currently available is inadequate for the types of concerns which need to be addressed. Of particular difficulty is the fact that there is a pronounced failure of comparability in information across post-secondary education, making current educational problems very difficult to assess and strategies for improvement difficult to formulate. All of us who work with information systems in data bases understand the complexity involved in collection, compilation, and presentation of information; but I would suggest that if we are trying to understand the confusion on the part of others we ask ourselves a simple question: How many students are enrolled in post-secondary education? My guess is that it would be difficult for us to answer the question without further clarification in four or five areas prior to formulating our response. There is some question, further, whether or not we can even give a meaningful single response for all post-secondary education. As former Chancellor Robert Mautz said, "Every time we provide a response to a question there are so many footnotes to explain the response that the information loses its value." From the legislative viewpoint, compatible data base should allow all users to talk with relative ease about similarities and dissimilarities of the operations in universities and community colleges.

The principal difficulty, of course, is attributable to the historical development of the universities contrasted to that of the community colleges. The fact that the State University System was intended to be governed from a central office as opposed to the local governing system

such as we find in the twenty-eight (28) community colleges necessarily has brought us to the fact that management information and the supporting data bases are different. The key concern from that development lies not in mandating strict similarity of systems and data bases, but rather in finding a methodology in which issues of concern to both sectors can be supported by an appropriate array of information which reflects current situations as well as permitting both an historical and prospective trend analysis.

The work of the special Joint Legislative and Executive Commission clearly pointed up the difficulties of the current system in meeting the types of concerns which have begun to emerge at the state decision making level. Despite the ability of both universities and community colleges to provide very large amounts of information on their current operations, it was virtually impossible to discern overall trends in the flow of students across sectors, institutions, and programs. Given that the State of Florida has to date formed its post-secondary education policy on the foundation of student flow from one sector to the other, the lack of information to assess the impacts of policies and funding causes considerable concern. It may well be that the questions being asked by the legislature are changing far faster than the ability of any information system to respond. Yet as other areas of our operations are moving toward a focus on quality as opposed to quantity, so too must our management information system shift in an effort to be able to respond to questions of process and quality as well as output and quantity.

No matter what the cause, it is imperative for all of us working with state level decision makers to examine the reasons that information currently does not exist in parallel form and to examine the needs (rather than preferences) for variety in data necessarily created by different structures of management information systems and which would necessarily evolve from variations in the role and mission of universities and community colleges. The fact that universities and community colleges receive their legislative appropriations in markedly different formats appears to impel in some measure the manner in which information is collected. That difference seems to be among the most difficult to understand, particularly when seemingly identical needs (faculty salaries for instance) are presented in not just a different, but in an incomparable manner. Noneducators have a considerable difficulty in comprehending how it is that like operations at different institutions are compared or contrasted with such great difficulty.

I think that over and above any specific difficulties inherent in existing management information systems, we are likely to see ourselves challenged even more directly as we mix "quantity to quality" discussions with the enduring "accountability" discussions. That is, as universities and community colleges will continue to approach the legislature with more specific requests for funding - say, in the area of salaries - the response will be a continuing effort on the part of the legislature first, to

accurately assess the magnitude and nature of the issue being presented; second, to simulate the effect of additional resources being appropriated to address the problem; and to see specific information in an understandable form to determine, thirdly, that the resources thus appropriated have in fact been used to address the specific difficulty and have achieved a certain level of results. The inability of any sector to meet these requirements will severely damage its legislative credibility.

Perhaps we need to work more closely to identify a set of reports of necessary information which the Legislature could receive on a regular basis. My own feeling is that for a body which is reconstituted every other year, this is not particularly feasible. The best means for streamlining information needs lies in continuing exchange forums - such as this - toward the end of deeper professional understanding on a staff to staff basis.

Bill Odom:

Who are the actors? Who are the decision makers? Some days it's the Legislature, some days it's the state boards, and other days it is local institutions and boards. Management information systems and their respective data bases must support the specific decision making structure and philosophy for which they were designed. Although compatibility is desirable, it should not be used as an excuse to restructure information systems and render them ineffective to the principal user.

Program budgeting seems to work within an institution or a department but not at the state level. Efforts were made some years ago to implement program budgeting on a system-wide basis, but such systems have not proven to be successful. It is frustrating now to be reconsidering a program budgeting approach for postsecondary education.

As far as remedial education is concerned, in response to an early question, there will be no compensatory education at the postsecondary level if the mandate remains in effect. However, institutions will do what is necessary to educate students regardless of what it is called or how it is funded.

Jim Morgan:

The management process in higher education is not well defined. We prepare for the legislative session by developing a data base, but we are never sure what demands will be placed on that data base. We are forced to second guess the Legislature and this is a high risk process. If we prepare for the right question everything is fine. Otherwise, we are collecting data on a crash basis, and it is almost certain to be incorrect.

If the management process were defined, if we knew the question in advance, we could significantly reduce the data base by not collecting unneeded data.

Artificial measures, such as FTE, are not standardized. Before any use can be made of these measures they must be rigorously defined.

The first step in structuring a management information system is to define the management process. This definitional process will establish not only what processes will be managed but what data is required to effect the desired management control. This has never been done in Higher Education in Florida.

University management and the Legislature need different data bases. The institutional data bases reflecting operational data would be useless at higher levels.

Legislative managers need to be aware that the accuracy of aggregated data is directly related to the preciseness of definition and that the preciseness of definition can only be achieved by a working partnership with the working-level users of that data.

Dallas Fox:

There is a difference between local management needs for information and State needs. Local management needs items they use daily, such as cash flows, budgeting data, assignment of research and instruction, and number of sections. Central office considerations include needs for programs, who provides what, and which programs belong where. These are two different management styles.

To satisfy the State needs for information by stocking a "large pond" with data might give the right answers, but it might not. The Legislature defines the needs so they have a chance of catching something. But different people in the Legislature ask different questions. There is a need for a large supply of data because the questions are not static. Some questions can be answered fairly quickly, but if the Legislature is asking about the appropriateness of research and what research is being undertaken, the answers may not be forthcoming. The kinds of questions asked by the Legislature are "ad hoc-ish" and not generally the same as those asked by institutional managers.

On counseling, within the formula, institutions don't keep track of dollars, but management keeps track of the total faculty effort expended in counseling. The Legislature needs fundamental data to make decisions. There are some salient things about institutions of higher education; therefore, data bases should be built around these long-term basics and not around changing legislative personnel. There is a formula to "generate" one faculty position with a percentage of time in instruction, research and service. But the formula's utility ends once the position has been

funded in the institution. The formula's usefulness is in the generation of a "need level" and to assist in fairly allocating resources, not for management control.

John Losak:

Mr. Law's comments are certainly appropriate and on target with regard to some of the major issues involved in the concept of a coordinated management information system on a statewide level. Indeed, there are considerable problems in attempting to prepare comparable data across all postsecondary institutions of education in the State of Florida for the Legislature. There are also difficulties with regard to formatting as well as complex issues with the content areas. My brief comments at this time will be addressed to the issue of providing comparable data.

Before addressing that major issue, however, I should say that there is no disagreement whatever that the State legislators as stewards of public funds have a duty to monitor the expenditure of these funds and to try to best determine if they are being expended effectively. I think all institutions and all research people associated with the various institutions are in complete agreement on this issue. The differences in views have to do essentially with the question of the manner in which this obligation is carried out.

The issue of providing comparable data relates directly to the manner in which concepts are operationally defined in a consistent manner. It is the task of statewide coordinating agencies to provide a working definition that is not only understandable in measurable terms, but also makes sense so that the reports from the various institutions can provide useful data for decision making. This is precisely where the rub is, however. To be more specific, let's use as the first example, the definition of program enrollment.

Program enrollment is currently defined by the State for the community colleges as the students' indication of intent to enroll in a program. What this means in operational terms is that, on the application form, the student indicates the choice of programs from among those offered by the College. At one level, this presents an operationally consistent definition. However, it does not meet the criterion of making sense. It does not, for the reasons that students often indicate a program for which they take absolutely no courses and in which, a year from their initial indication, they have no intention of completing. Often times if they are asked one year after they have indicated their program enrollment on the application form, they cannot recollect what program they were previously intending to enroll for. This is related to the nature of community college students who are often unsophisticated with regard to college offerings, having themselves come from families where there may be no one who has ever attended a college before, and for whom the words in the catalog have little significance. The community college experience is

designed in many ways to be a time during which students deliberate among the opportunities available to them and come up with a program before they graduate. At Miami-Dade, for example, students are not counted in a program until they have 24 college credit hours. In this way, we feel that we are representing the reality of student choice in a much more meaningful way. However, the Division of Community Colleges has said that Miami-Dade may not report data in this manner because it is not in line with the other colleges, meaning that we have to report the intent of these students. The net result of reporting the intent in the manner prescribed by the State is that the tables reviewed by the legislators may reveal such anomalies as 500 students enrolled in a particular program, 400 of whom drop out after the first year and perhaps only 5 or 10 ever graduate. It is only by understanding that students' initial intent and actual behavior in later semesters may not coincide that we can grasp the error of the "consistent" definition.

The next example of providing consistent data for state's higher education comes from the V.A. Students must be eligible to receive V.A. benefits by enrolling in programs which are V.A. approved. In order for the programs to be approved, the V.A. has decided that 50 percent of the graduates must be enrolled in a related field. Yet, when one looks closely at the report, 50 percent is defined as 50 percent of those who respond to the questionnaire. Naturally, there is a strong bias in favor of those students who are working in their field to respond to the questionnaire. Again, although the data are consistent, they are meaningless and, in fact, in this instance may lead to decisions which are quite different from decisions which might be reached were there to be a more meaningful definition of respondents.

Finally, it is indeed reasonable for the Legislature to want to know what is happening in remedial education. This concept requires expensive outlay of taxpayers' dollars and there certainly should be sufficient accountability and research efforts in order to continue to have these funds expended in the current manner. In this area, however, one runs into the difficulties of content definition. There are very few consistent definitions of remedial education. For example, at most colleges, students are required to take remedial courses if they score below a particular point on a standardized test. The point at which students go into remedial education is widely divergent among colleges, for one thing, and that does not even begin to address the problem of what is offered to the students once they enroll in their remedial programs. It is often the case that colleges report percentages of students who pass remedial programs, offering this as evidence of success. From a research point of view, this is totally inadequate, and a much harder look at more rigorous research designs established to answer the question in a more formal and meaningful way is essential if taxpayers' monies are to be looked after more carefully. This is such a large area of conflict involving such enormous expenditures that it would seem to be a good idea to establish a statewide task force to adequately assess the depth of the problem and to make specific suggestions regarding reporting of effectiveness data to the State.

Audience Response

Jeaninne Webb:

The answer to the question by Bill Law (It is unreasonable for the Legislature to want to know what is happening in research?) must account for the difficulty in defining research and the difficulty in responding to what the research effort should be.

Craig Johnson:

There appear to be two questions being asked:

(1) If the Legislature is looking at problems over time, what data base is necessary over time (the data base for longer enduring problems?

(2) How can a data base respond if, in the heat of legislative sessions, questions occur to those who don't understand data anyway?

Dan Coleman:

Different people in the system want different things. Especially as the actors change, the questions change. Each institution should collect its own data and then cull or rework it for the Legislature. Institutions probably send three times as much information to the BOR than they would if institutions were told what was needed.

Harry Rudy:

In terms of providing data, some institutions are hampered by their capabilities to provide data as institutions' computer capacities range from none to very sophisticated.

Pete Tully:

These questions have been around for a long time. They existed before MIS, and they have not been answered because Presidents don't want them answered. For example, counseling dollars are generated by FTE, but Presidents don't want anyone looking at how the positions are used. "Don't ask questions that can't be audited."

The Community Colleges' Accounting for Quality

How does the Community College Coordinating Board want to demonstrate quality? What are the uses of the information which results from being accountable?

Chair: Myron Blee, Bureau Chief, Program Support and Services, Division of Community Colleges

Richard Bedics, Director, Instructional Services, Pensacola Junior College

Mantha Mehallis, Director, Institutional Research and Planning, Broward Community College

Quality and the State Community College Coordinating Board
by Myron R. Blee

The State Community College Coordinating Board was established by an act of the 1979 Session of the Florida Legislature as a state level body to help assure that the twenty-eight (28) community colleges, under operating control of their respective district boards of trustees are effective and efficient in meeting both district and state needs to the extent permitted by resources that are available. During the year 1979-80, the Coordinating Board has been appointed and organized, and the Board has lost no time in becoming actively a constructive force in the complex circumstances in which community colleges function.

Among the first expressions of the State Community College Coordinating Board were concerns for the quality of services being provided by the several colleges. A committee of the Board has now formulated a general framework within which quality can be fostered, safeguarded, and demonstrated. Principal components of that framework are the following:

1. Under provisions of statutes and rules of the State Board of Education, the Coordinating Board is responsible for establishing a framework within which the respective district boards of trustees can demonstrate with meaningful measure the quality of services provided by the colleges.

2. Responsibility for quality assurance is vested in the respective district boards of trustees.

3. One indicator of quality is found in how well the students perform in roles for which the college, in one way or another, provided preparation. For associate of arts graduates there needs to be determination of how well the students perform in upper division programs. For students who complete occupational programs there needs to be determination of how well the students perform in employment for which they were prepared.

4. Quality assurance is one component of the larger system of accountability which is established in the rules of the State Board of Education, and which is intended to foster responsible decision making, at the district level, regarding services provided by the colleges and the use of resources required to provide those services.

Principal among the actions to be expected from the State Community College Coordinating Board are the following:

1. The acquisition of funds which will enable colleges to define student performance standards for the awarding of certificates and degrees and to evaluate the performance of students both prior to the awarding of certificates or degrees and again when they are engaging in the activities for which they were prepared.

2. The fostering of interinstitutional cooperation in the development and use of systems for assessing performance of students who complete instructional programs in community colleges.

3. Participation in the review of accountability reports from the respective district boards of trustees to assure that the accountability system is utilized to assure that local decision making achieves optimum benefits to the respective districts and to the State of Florida.

REPORT OF
THE ACADEMIC QUALITY SUBCOMMITTEE:
A CONCEPT AND RECOMMENDATIONS

Under the provisions of Florida Statutes and rules of the State Board of Education, the responsibility for defining, attaining, maintaining, and demonstrating quality in Florida's community colleges is vested in the respective District Boards of Trustees. Under such rules, state-level agencies, including the State Community College Coordinating Board, are to establish a framework within which District Boards of Trustees exercise that responsibility. The role of the Coordinating Board in this regard is as important as it is delicate. The Board has an opportunity to make a significant contribution by assisting the District Boards of Trustees in their efforts to demonstrate and improve the quality of the academic services they provide.

The concern for quality is not new to the Florida Community College System and the current efforts should be considered a part of the larger program of system accountability. The purpose of such an accountability plan is to improve the colleges by fostering responsible decision-making with regard to the educational services provided to the students at the individual colleges. The assessment of the quality of these services and the systematic re-evaluation of our practices is a complex task. Many factors relate to the establishment of a quality academic experience (e.g. student preparedness and motivation, the physical environment for learning, the materials and supplies necessary for learning, and the teaching faculty). The performance of students who have utilized our instructional services can be viewed as one of the several indicators of quality. Even though input and process variables need to be given appropriate attention, it is important to establish that one after-the-fact barometer of quality is available in how well

students perform in roles for which the college, in one way or another, provided preparation.

The relationship between the quality of programs and services of colleges and the subsequent performance of students is not a simple one. It is particularly important that this emphasis on quality not inhibit the system's commitment to equality of educational opportunity. Indeed, the relationship exists in such a complex of variables that prudence dictates that thoughts concerning quality of programs and services which are drawn from this relationship be formulated as hypotheses to be explored or investigated rather than firm conclusions of fact. The results of these explorations may help to refine the operational definitions of quality in such a way that the effect upon the community colleges will be positive and provide the framework for constructive change.

The committee has formulated recommendations in three areas. The first is a general recommendation establishing a vehicle for the Coordinating Board to continue its leadership role. Secondly, the assessment of student progress during the community college experience is explained. The "value added" concept is presented as a touchstone for many of the services provided to students. The final area treated is the performance of our graduates as they transfer to universities in Florida. The study proposed is exciting because it helps to eliminate many of the problems associated with gross grade comparisons.

As we consider these comments and recommendations, it is crucial to remember that the community college has at least three basic functions to perform in meeting local needs:

- academic transfer programs
- occupational, technical programs
- life-long learning and avocational programs

While these diverse areas of emphasis provide the key to the mission of the community college, they also present accountability concerns which are not easily answered. The committee's hope is that we can meet our accountability standards in an imaginative way which will not cause us to diminish the availability of our services to our students.

RECOMMENDATION A: The Coordinating Board establish an Academic Quality Planning and Coordinating Committee to oversee all of the activities related to accounting for academic quality. This committee would supplant the current subcommittee and would be responsible for implementing the program elements recommended in this document. The committee would report to the Coordinating Board and would make recommendations for the enhancement of our system-wide emphasis on quality. Further, the committee would be empowered to form sub-groups, as needed, to assist in the accomplishment of these goals. The suggested committee membership is as follows: a member of the Coordinating Board or designee, a faculty member, a college president, a currently enrolled student, an institutional research person, two college administrators selected for their background and interest in academic quality, and a representative from the Inter-Institutional Research Council.

Student Progress at the Community College: The "Value-Added" Concept. The evaluation of the quality of a community college education is presently being done in many areas. For example, it is being used in the areas of basic skills assessment, occupational program accreditation, program completion, and articulation studies. See Appendix A for additional examples.

Each college has a unique curriculum assignment commensurate with its service area as well as programs which are similar to these provided in other community colleges. Consequently, each college develops

a system for determining student progress in achieving the skills and knowledge provided by their own college. Although not all of the skills and knowledge obtained by the student can be measured readily, much of that which results from being exposed to the college parallel programs, occupational /technical programs, and community service programs can be identified. It is important that this identification be done carefully to assure that valuable services are not diminished in the process.

The system developed for measuring student progress at the community college should be designed in such a way as to reflect that which has been learned as a result of attending the community college. This "value added" approach provides the opportunity to be accountable without being inordinately prescriptive. The implementation of these assessment strategies will require a significant amount of coordinating and creativity.

RECOMMENDATION B: That a subcommittee be established to:

1. Identify and describe current measures of quality
2. Identify and describe needed measures of quality
3. Propose methods of assessment

The subcommittee will report to the Academic Quality Planning and Coordinating Committee and be directed by this group.

The subcommittee should be comprised of representatives from the areas of academic affairs, student affairs, vocational/occupational programs, institutional research, and community services. The subcommittee should be authorized to identify additional individuals as needed to accomplish the assigned task.

Proposed Transfer Student Study Model

Many colleges have initiated efforts to assess the quality of their transfer students as they continue at the university. The results of these efforts have led to changes in instruction, curriculum, advisement, and other services of colleges. Subjective measurements of student perceptions of value or quality have further enhanced the review and evaluation of programs at colleges. A basic problem with some of these assessments has been an inability to apply the methodology and procedures system-wide. Further, the lack of conformity has led to diminished application and acceptance of the results. The assessment study should be applicable across colleges and must be reported in such a way as to be useful to local boards of trustees and the general public.

Grade point average seems to have certain advantages in this area. The GPA is numerical and readily submits to analysis and comparison. Every student has several (term, cumulative, lower division, upper division, etc).

A basic problem with GPA is the multiplicity of factors contributing to the specific average. Grading practices at all levels; student background or level of preparation; difficulty of subject; quality of instruction; and student choice of field are just a few of these factors. Too often the use of GPA for assessment falls into the pattern of raw comparisons between groups without due regard for the factors which contribute to the grade point average. For example, within the narrow confines of a specific class a higher GPA can well indicate attainment of the objectives of that class. However, even between two classes in the same subject taught by different teachers, we cannot always show that the higher GPA measures greater attainment of the objectives of a course. The problems lie in a common understanding of those objectives

and the grading perceptions of the teachers (one could include value added or student gain as part of the grades and the other use only measures of subject matter mastery).

The grade point average has public support and the advantage of availability. We are proposing that the GPA be adjusted for those variables which can be identified (see Appendix B) to better reflect the variables outside the control of the college. Further, we should realize that GPA comparisons are at best indicators and are not specific as to cause. Differences, even with adjustments for as many factors as possible, do not in and of themselves tell the cause of these differences. They could well reflect quality problems in some program of the college. The program could be instruction, advisement, financial aid, or any one of a multiplicity of factors both within and outside the control of the institution. GPA studies should be used within a much broader framework of assessment systems as an element of assessment, not as the assessment. This component should be made and could well provide both insight and support to the larger system of accountability.

RECOMMENDATION C-1: The Coordinating Board adopt the proposed transfer student study model as a legislative priority for 1980-81. The Board should seek to secure the resources necessary to bring this study to conclusion.

RECOMMENDATION C-2: A subcommittee of the Academic Quality Planning and Coordinating Committee be established to act as an executive body to the study. This group should be composed of individuals with technical research competence and they should interact directly with the project manager. The subcommittee would also be responsible for assuring that the appropriate evaluation procedures are applied to the project and its products prior to dissemination to the local boards of trustees.

APPENDIX A

Types of Data Currently Available in the Division of Community Colleges That Could be Related to Quality of Education Measures.

1. Percentages of completors of occupational programs between 1975-78 who were placed in field for which trained--Identifies percentage of occupational students who completed their programs in the community college system who were placed in field. It includes aggregate figures but does not report on occupations where there are less than three programs in the system. Also included is a breakdown of completors of Advanced and Professional and Occupational programs by placed in field, placed out of field, continuing education, and status unknown for the 1975-78 period.
2. Follow-up, withdrawal, and drop-out studies--Identifies number of students transferring, planning to return, achieving educational goals, and not achieving educational goals. It also includes specification of assessment of definitions of program entry and exit competencies, definition of employment skills, and program alterations based upon review of placement and follow-up data.
3. Vocational Division instructional program review for community college occupational proficiency programs--Includes planning and operational processes, results of student achievement, results of student employment success, and results of additional services.

4. Longitudinal study comparing information about university native and community college transfer students holding an associate degee who are in the State University System of Florida--Includes similar data relating to age, sex, academic major, grade point averages, rate of academic terminations, average course load per quarter, number of times students change majors, and number of hours accumulated in upper division prior to graduation.
5. Feedback system on follow-up and placement--Utilizes information from Department of Labor and Employment Security and State University System data to locate graduates who continue their education or enter the labor force. It identifies sex, academic major, course load, industrial code, weeks worked, and wages earned.
6. Articulation studies--Provides information concerning all undergraduate students in the State University System who list previous attendance at a Florida public community college. This includes data concerning race, sex, age, year of entry, hours transferred, hours accepted toward a degree, grade point average, major, and universities and community colleges attended.
7. Display of grade point averages by academic majors--Indicates grade point average by major with designation of the community college and university attended for transfer students who have either an A.A. degree, A.S. degree, or at least the equivalency of 90 quarter hours of work.

8. Status report on community college graduates who have taken the Registered Nurse exam for the first time--Provides numbers and percentages of community college students who take the exam and pass it with a breakdown by community college according to race.
9. American College Test scores of college of education majors at the University of South Florida in 1976--Includes mean and standard deviation scores for students in the areas of English, mathematics, social science, and natural science with a breakdown by institution attended for lower level college work.
10. "Evaluation of Programs in Community Colleges" paper, March 31, 1977--Outlines the plan being utilized by the Division of Community Colleges for the evaluation of community college programs.

APPENDIX B

USE OF GRADE POINT AVERAGES AS QUALITY INDICATIONS

Research on grading practices has indicated that institutions differ in grading standards (McGuire, 1960; Stern, 1965). This was supported by data reported in Articulation 1977, Florida State Department of Education, (pp. 25-27). Specifically, grade point averages of transfer students in Florida universities varied from a low of 2.62 at the University of Florida to a high of 2.90 at the University of West Florida.

Nickens (1970) compared grade point averages of transfer students and native students at the Florida State University. It was found that native students had higher averages, but their placement scores on the Florida Twelfth Grade Placement Test were also higher. Using analyses for covariance to adjust for the difference in placement scores resulted in no significant difference in averages.

Numerous studies have documented the differential in academic qualification of native students and transfer students. This differential has been accounted for in terms of selection policy differences, socio-economic factors, and academic advice of high school counselors. In any case, meaningful comparisons of averages across institutions as an evaluation measure must control for initial differences in student qualification. Probably the best single factor for such control is high school grades (Lunneborg, 1967).

Articulation 1977 compared averages across majors for each university. It can be noted (pp. 33-37) that averages varied considerably

Another phenomenon that has been widely discussed is that of decline of transfer student averages on transfer to a university. This phenomenon was called "transfer shock" by Hills (1965), but explained by regression toward the mean by Nickens (1971). Specifically transfer students must have a 2.00 or higher average to be admitted to the universities. Thus, the lower part of the community college grade distribution was removed by selection. This inhibits the upward shift of low averages toward the mean, but the downward shift of higher averages toward the mean was not inhibited.

Summary. Previous research indicated that the potential use of grade point averages of transfer students as an evaluative criterion of academic quality is enhanced if the averages are adjusted to control for:

1. effects of grading practice variation across universities
2. effects of variation in grading practice across majors
3. variations of academic aptitude of students across community colleges
4. regression toward the mean community college and lower division averages

The Proposed GPA Academic Quality Evaluation Component

The Academic Quality Subcommittee proposes to develop a system for providing information on academic quality of the community college transfer program. This proposed system would provide community college grade point averages of transfer students by community college as follows:

1. adjusted for differences in university grading practices,
2. adjusted for differences in major grading practices,
3. adjusted for differences in academic aptitude of students, and
4. adjusted for "regression toward the mean" effects.

The format would appear as in figure 1.

FIGURE 1

Institution	Community College or Lower Division Last Term GPA	Rank	Adjusted GPA	Rank	University Upper Division First Term GPA	Rank	Adjusted GPA	Rank
Brevard CC								
Broward CC								
Central Florida CC								
Chipola JC								
Daytona Beach CC								
Edison CC								
Fl. JC at Jacksonville								
Florida Keys CC								
Gulf Coast CC								
Hillsborough CC								
Indian River CC								
Lake City CC								
Lake Sumter CC								
Manatee JC								
Miami-Dade CC								
North Florida JC								
Okaloosa-Walton JC								
Palm Beach JC								
Pasco-Hernando CC								
Pensacola JC								
Polk CC								
Santa Fe CC								
Seminole JC								
South Florida JC								
St. Johns River JC								
St. Petersburg JC								
Tallahassee CC								
Valencia CC								
All Community Colleges								
Fl. Atlantic Univ.	---		---					
Fl. International Univ.	---		---					
Fl. State Univ,								
Univ. of Central Fl.								
Univ. of Fl.								
Univ. of North Fl.	---		---					
Univ. of South Fl.								
Univ. of West Fl.	---		---					
State University System								

Procedure

Each Florida community college will provide the project staff with a machine processable data source (tape or cards) for the 1979-80 academic year (exclusive of summer). The data will be of all students who were enrolled in a transfer program during this academic year. The specific data elements will consist of:

1. social security number,
2. community college grade point average for last term of attendance,
3. high school grade point average as indicated on the student's high school transcript, and
4. cumulative hours earned.

Social security numbers will be matched against the Fall 1980 Board of Regents' Student Data Course File and Admissions Data File. For matched numbers records will be added to a new file with the following data:

1. fall term hours for GPA, and grade points earned,
2. high school grade point average,
3. test scores and test name,
4. cumulative hours transferred,
5. current course load, and
6. major program.

Analysis of Data

Regression analysis will be used to determine the relationship between fall term university grade point averages and high school grade point averages, test scores, university major (program), and

university. This analysis will result in a formula that will be applied to the unviersity grade point average to produce an adjusted university average.

The total community college transfer population who transferred to a university will be included in computing the community college grade point averages. Also, regression analysis will be used to determine the relationship between these averages and high school grade point averages. The community college grade point averages will be adjusted according to a resulting formula.

Time Table

The project staff will begin writing computer software to handle the requirement of the projection July 1. The programs will be debugged and operational by September 30. Community colleges will begin preparing machine processable data, including the adding of high school averages on July 1. The colleges will submit their files to IRC by September 30.

The project staff will begin formatting the colleges' data and building the input file to the Admissions File and Student Data Course File on October 1. The input file will be completed by December 30.

The input file will be matched against the Admissions File by January 30, 1981. During February, the regression analysis to determine the relationship of high school grade point averages to community college averages will be completed.

During March 1981, the Student Data Course File will be available and the analysis of university data will be completed. The final report will be presented to the Community College Coordinating Board May 30, 1981.

References

Florida State Department of Education, Comparison of cumulative grade-point averages attained in universities of students transferring prior to earning 90 quarter hours (p) and student transferring after earning 90 quarter hours (a), Articulation 1977, p. 25-27.

Florida State Department of Education, Florida community college transfer students attending Florida public universities in the fall classified by major and university, Articulation 1977, p. 33-37.

Hills, J.R., Transfer shock: The academic performance of the junior-college transfer, The Journal of Experimental Education, 1965, 33 (3), 201-216.

Lunneborg, P., and Lunneborg, C., Improving prediction of academic achievement for transfer students, Personnel and Guidance Journal, 1967, 45, 993-995.

Nickens, John M., The effect of attendance at Florida junior colleges on final performance of baccalaureate degree candidates in selected majors at the Florida State University, College and University, 1970, 45 (3). 281-288.

Nickens, John M., Transfer shock or transfer ecstasy? Paper presented at the American Educational Research Association National Convention, Chicago, Illinois, April 15, 1972.

PROGRAM MAPPING: QUALITY CONTROL FOR ACADEMIC PROGRAMS

by

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Quality within an institution's academic program is often very difficult to determine. Program mapping is just one of many tools available which enables an educational institution to evaluate and clarify the learning outcomes of its educational programs. The program mapping process serves as a decision making model that is easily communicated to others.[1] More specifically the academic program map illustrates the rationale for the existence of each learning outcome: a program map is a graphic representation of the interdependent relationships among various learning components of an academic program; this graphic representation shows the components of one level as prerequisite to those at the next higher level.[2] One has not only the prerequisite skills but also the exit skills for each level. This enables educators to structure their academic programs so that the minimal professional entry level skills of their graduates can be assured.

In the Figure 1 program map the Sophomore Course has two prerequisite learning components: Field Experience X and Freshman Course Y. If a student has successfully achieved the learning outcomes of Field Experience X and Course Y, the map shows that one would have the necessary prerequisite background to take the Sophomore Course.

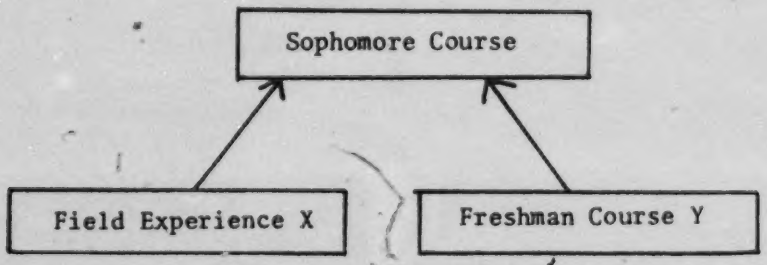


Figure 1

Suppose there were three learning components listed in your college's catalog under the Department of Business Administration as B306 (a practicum), B316 (a course), and B412 (a special project). Students may have asked the question:

"Must we take B306 before we take B316?"

An adviser's response may have been: "No, you may take B306 and B316 during the same semester, but both learning experiences must be taken before you take B412."

What the adviser has said may be shown graphically as a map: (see Figure 2)

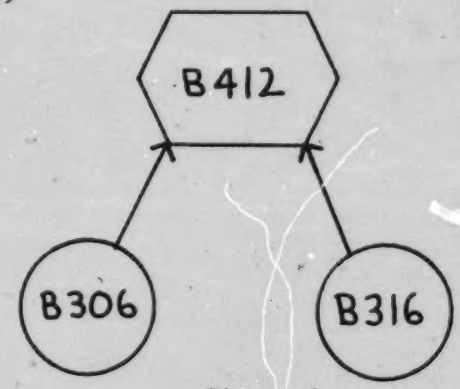
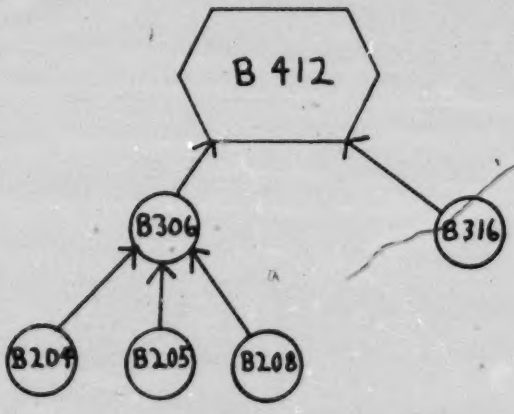


Figure 2

Interpreting the Map:

B412 requires B306 and B316 as immediate prerequisite learning components. However, B316 does not require B306 as a prerequisitie. Similarly, B306 does not require B316 as a prerequisite.

If prerequisite learning components for the practicum B306 could be identified from the catalog listing, they could be shown as in Figure 3.[3]



In this map, B204, B205, and B208 are all immediate prerequisites to B306.

Figure 3

An example of a program map of an existing program in child care at Pensacola Junior College is shown in Figure 4. Note that a list of the names of the learning components accompanies the program map, along with the number of credits. Faculty within this program have written the prerequisite and exit skills for each course. In addition, the faculty at Pensacola Junior College and University of West Florida have developed a program map for the Early Childhood Education Program (figure 5) which indicates the courses offered at each institution leading to an Associate of Arts Degree and a Bachelor's Degree.

To date, program mapping has had a tremendous effect upon the structure of the curriculum at Pensacola Junior College. Specific examples are:

1. Academic advising of students has been simplified. The students see at a glance a visual representation of their total program. Prerequisites are readily identified.
2. The mapping process has enabled faculty to organize their programs in a logical sequence. The mapping process emphasizes the need to organize the entry and exit level skills required of the students for each course within a program.
3. The program maps have allowed for programmatic reorganization and restructure by providing a visual representation to faculty of their total program. This has allowed faculty to see the fit of individual courses within the total program plan.
4. Administrative decisions have been made more objectively. Decisions about frequency and timing of a course and the instructor for a course have been made in reference to the effects on the total program.
5. In this era of retrenchment, decisions about course revision or deletion have been made objectively based upon programmatic needs rather than subjectively based on faculty personality or tradition.

6. Orientation of adjunct-faculty to the total program has been facilitated. Part time faculty have been able to understand how their course contributes to the total program.
7. Program mapping has been a tremendous vehicle for cooperative faculty participation both within and outside their program specialities.
8. Most importantly, it has helped to structure a total program so that students can win.

---

[1] Cook, J. Marvin, Developing Program Maps, Council for the Advancement of Experiential Learning, American City Building, Suite 212, Columbia, Maryland p. 8.

[2] Ibid. p. 18.

[3] Ibid. pp. 20-21.

APPENDIX

Figures 4-A ---------- Program - Child Care

4-B ---------- Program Map

4-C & 4-D ---------- Major Learning Outcomes

Figure 5 ---------- Early Childhood Program Map

Figure 4-A

PROGRAM: CHILD CARE

PROGRAM MANAGER: DR. ANN SOUTHERLAND
DEPARTMENT OF HOME ECONOMICS
PENSACOLA JUNIOR COLLEGE

The Child Care program is a two-year associate of science curriculum designed to prepare a child care specialist with basic competencies to assume the primary responsibility for the daily activities of groups of preschool children in center-based programs. The major emphasis is for the practitioner to translate contemporary theory into practical application.

Normally the graduate begins employment in a child care center working directly with children up to the age of four.

Freshman Year

Term I		Term II	
ENC 1103 English Composition	3 cr.	HUM 2930 Technological Humanities	2 cr.
SSI 1011 Social Science Survey	3	SSI 1012 Social Science Survey	3
CHD 1804 Intro. to Child Care	2	CHD 1340 Language Development	3
CHD 1820 Physical Needs of Child	3	CHD 1221 Cognitive Development	3
CHD 1821 Infancy	3	CHD 1824 Emotional Development	3
		CHD 2440 Practicum	2

Sophomore Year

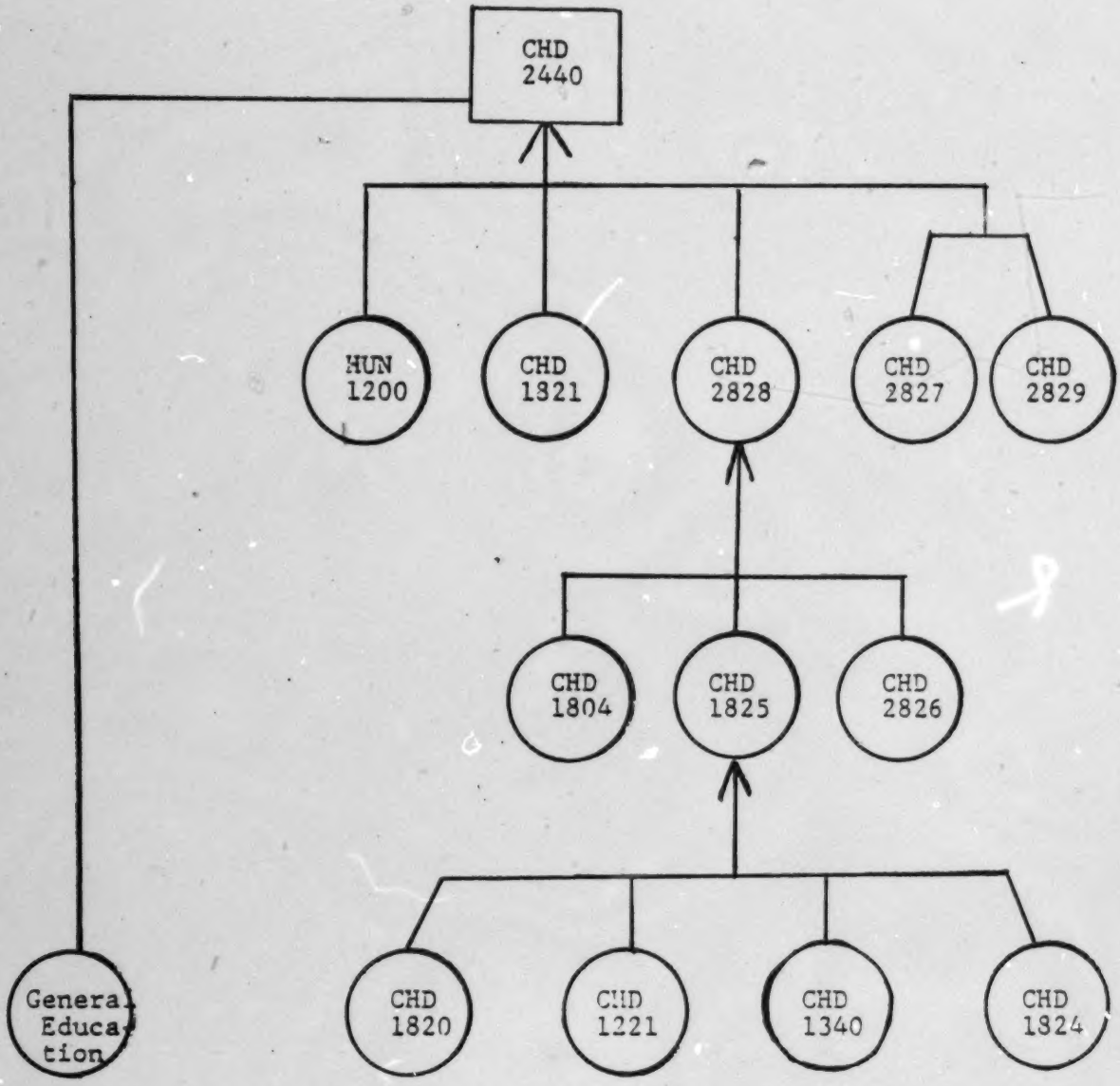
Term I		Term II	
BSC 1030 Biology	3 cr.	BSC 1031 Biology or AST 1005	3 cr.
ENC 1136 English Composition	3	MGF 1113 Math or MAE 1810	3
CHD 1825 Interrelationships	2	CHD 2828 Teaching Young Children	3
CHD 2826 Exploration of Media	3	HUN 1200 Basic Nutrition for Food Service	3
CHD 2827 Parenthood	3	CHD 2829 Interaction of Child's World	3
CHD 2440 Practicum	3		

Figure 4-B

CHILD CARE PROGRAM

PENSACOLA JUNIOR COLLEGE

HOME ECONOMICS DEPARTMENT



Prepared by:

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Figure 4-C

CHILD CARE PROGRAM

MAJOR LEARNING OUTCOMES

CHD 2440 Supervised Practicum (3 Credit Hours)

Given a field experience setting with the responsibility for a group of young children in a preschool or child care setting, each of the following learning outcomes should occur:

1. The student will manage the children in the classroom. To be rated satisfactory, the student must provide a routine, set limits and rules and keep necessary records for the developmental level of the children.

2. The student will plan and carry out activities. To be rated satisfactory, the student must plan and carry out activities that promote develoment of the children in the follqwing areas: physical, intellectual, emotional and cognitive.

3. The student will arrange an appropriate classroom environment. To be rated satisfactory, the student must arrange environment appropriate for the developmental level of the children.

4. The student will demonstrate behaviors and provide activities that promote self concept and independence of each child in the group. To be rated satisfactory, the student must provide positive reinforcement, demonstrate caring behaviors, and allow each child to be independent appropriate for his developmental level.

5. The student will demonstrate positive and productive relationships with parents and other staff members of the center. To be rated satisfactory, the student must encourage parent participation in center activities and work cooperatively with other staff members in center plans, activities, policies and rules.

CHD 2828 Teaching Young Children (3 Credit Hours)

1. Given an example of a child care setting, the student will describe the management functions. To be rated satisfactory, the student must include laws and regulations of licensing, staffing and personnel practices, budgeting processes, planning and maintaining physical plant, food and transportation servtes, record keeping and in-service training.

2. Given written tests, the student should be able to describe the purposes of professional organizations, list organizations for teachers of young children, and identify the publications of organizations.

3. Given written tests, the student will describe a theory of instruction. To be rated satisfactory, the student must describe the rationale, teaching strategies, and teaching techniques and their relationships.

4. Given written tests, the student will describe factors in planning a lesson and organizing the environment to insure that goals for children are reached.

5. Given resources, the student will write a long-range curriculum plan for a designated group of children.

6. Given an example of a child care setting, the student will plan a schedule for a child care center. To be rated satisfactory, the schedule should reflect flexibility appropriate for the group of children, needs of the age levels, weather and seasonal considerations.

7. Given a small group of children, the student will teach the group for approximately an hour. To be rated satisfactory, the student must plan activities, arrange the environment, and carry out the activities appropriately for the developmental level of the children.

CHD 2827 Parenthood (3 Credit Hours)

1. Given a procedure and resources, the student will describe methods for communicating with parents and for encouraging parents to participate in center activities.

2. Given a procedure and resources, the student will make a file of materials to be used to teach children about different ethnic groups. To be rated satisfactory, the student must designate the cultural element the materials match and the approximate age for whom they are appropriate.

3. Given resources, plan an activity in which children from different ethnic backgrounds have an opportunity to talk about family customs, foods or holidays.

4. Given written tests, the student will be able to identify and describe the following elements of parenting: motivations for parenthood, parenting roles, changing concepts in parenting, developmental role of parenting, family variations and their effects, and challenges in parenting.

5. Given written tests, the student will describe the socialization process of the child.

6. In a written or oral situation, the student will be able to discuss the parents' position as decision-maker in a child care center's policies.

CHD 2829 Interaction of the Child's World (3 Credit Hours)

1. Given written tests, the student will name and describe specific needs of special groupings of children and their families including handicapped children, emotionally and socially abused children, and economically deprived children.

2. Given written tests, the student will name social concerns relating to children such as divorce, young mother, working mother, migrant children, etc. and will describe their influence on the child and their needs for special services for these children.

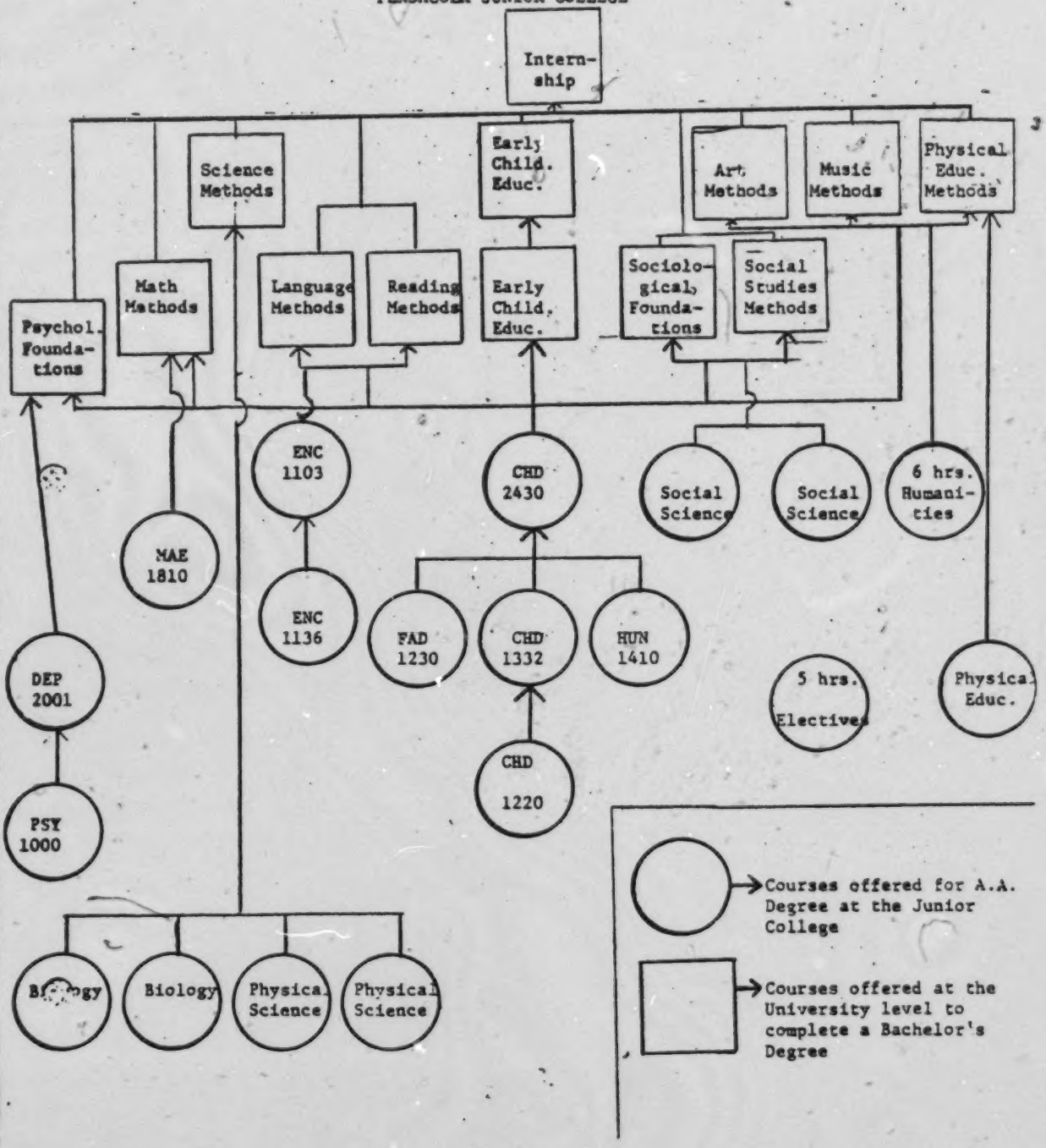
3. Given a procedure for carrying out, the student will make a collection of data on community resources for meeting family needs. To be rated satisfactory, the student should include financial, emotional, physical and intellectual needs.

Figure 5

PROGRAM MAP FOR THE EARLY CHILDHOOD PROGRAM

HOME ECONOMICS DEPARTMENT

PENSACOLA JUNIOR COLLEGE



The Community Colleges' Accounting for Quality "One Step Beyond"

Presented by Mantha Mehallis
Broward Community College

The Community College system in Florida has developed a very well-defined management information system (CCMIS) for the purpose of gathering information for the legislature. Use of the CCMIS has matured to the point where most information collection is routine and systematic. The next step beyond data collection is the operational definition of "quality" and the assessment of it. In order to discuss the issues in perspective, one first should look at what type of information is being collected.

The categories of reported information include the following:

a. Financial
b. Facilities
c. Capital outlay
d. Personnel and salaries
e. Enrollments
f. Staff and program development
g. Placement and follow-up.

The concept of "quality" is not included in the CCMIS Manual -- and, maybe, rightly so, since it is a procedures manual. In fact, even the section on "Placement and Follow-up," which comes closest to indicating quality of the graduates and programs, only mentions distribution of the information to such groups as the Legislature as the purpose for its collection.

So, the question becomes, "How might information be used to assess quality?" Assessment has been defined as the measurement, analysis, appraisal and evaluation of the attainment or increase of some desired and intended accomplishment for individuals or groups of students (Lenning, 1977). Many colleges and universities use assessment techniques only for grading, however, the following list indicates additional applications:

a. Planning learning experiences -- understanding input level, academic achievement, learner characteristics, learning styles, environmental impact, etc.

b. Feedback for student counseling & advising
c. Diagnosing student problems
d. Classification and categorization by student profile
e. Grading, promotion, and merit awards
f. Evaluating and planning programs
g. Evaluating and planning the instructional process
h. Articulation of transfers
i. Identification of the "state of the art"
j. Problem identification and resolution

Appropriate techniques for assessment may inclued one or a combination of the following:

a. Needs assessment of specific constituencies
b. Cost-benefit studies
c. Follow-up of completers and leavers
d. Evaluation of competency-based curricula
e. Incentive approaches
f. Special studies
g. Accreditation studies
h. Others

The researcher should be concerned about assessment as the student enters the institution, progress while the student is in the process, and performance after the student has left the institution. "Accountability has been defined as "intensely close surveillance." The surveillance should focus upon student characteristics which are potentially changeable by the college experience. These may include some of the following:

a. Competence and skills
b. Social roles
c. Knowledge and understanding
d. Morale, satisfaction, & affective characteristics
e. Status, recognition, and certification
f. Aspirations
g. Perceptional skills
h. Psychological characteristics

Once standards of quality are established and recognized as such, assessment of quality may take place.

Issues

Following below is a listing of issues which should be addressed by colleges and universities before "One Step Beyond" data-gathering can be taken effectively:

1. Differentiation between assessment and prediction
2. Agreement on appropriate criteria for assessment
3. Assessment of realistic and attainable goals and objectives leading to formation of long-range plans
4. Realization of the discrepancies between what is on paper (catalogs and reports) and what is really being taught. Reports suggest a linear, sequential progression of courses which normally are not followed. Rudolph (1977) said that universities speak of "core curricula" and "general education" as though they were real programs, when, in fact, they are ideals.

5. The need for more student involvement in the learning process as opposed to student participation by whim.

6. Determination of how much developmental or remedial education can be afforded by institutions?

7. Reconciliation of curriculum with students' course-taking patterns -- Actually about 10% of the enrollees in community colleges nationally graduate with degrees. This fact implies that whatever educative value colleges provide for students comes through single courses instead of through programs.

8. Uses of information from follow-up studies to impact the college at the classroom and counseling levels.

9. Uses of data from needs assessments to develop long range plans.

10. Operational definition of quality and its application to all facets of education.

Dressel (1976) addresses possible changes which may result from evaluation in terms of input, environment, processes, and output. Until these issues can be effectively addressed, with regard to quality, the data-gatherers will not have gone, "one step beyond."

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Program Budgeting Revisited

If the base for funding shifts from enrollment to program, what does it mean for the institution and for institutional research?

Chair: Gary Lott, Coordinator, Academic Programs, SUS

Pat Barrett, Staff, House Appropriations Committee

Albert Hartley, Vice President for Administration and Finance, USF

Bill Shade, Senior Governmental Analyst, Office of the Governor

The Impact of Program Budgeting Upon Offices of Institutional Research In the SUS of Florida by Albert Hartley (read by Don Anderson)

In speculating about the impact of program budgeting upon offices of institutional research in the State University System (SUS) of Florida, it is instructive to reflect upon our historical budgeting practices and the role played by offices of institutional research in the budget process in past years.

The SUS of Florida, in my opinion, has followed an eclectic path during the past decade in its budgeting procedures. That is, we have adopted selected characteristics of various budget models to meet our particular objectives. Currently, our budget process encompasses selected features of zero-base budgeting, incremental budgeting, formula budgeting, and program budgeting. This has occurred over a number of years as a result of interactions between the legislative and executive branches of state government on the one hand and the SUS and the national higher education community on the other hand. Consider, for example, the following three illustrations of the diversity of our budget system:

> The USF Medical Center is defined as a separate budget entity and receives a direct appropriation from the Legislature. The budget request process and formats for the Medical Center budget are a good example of the program budget model used to request and justify resource requirements.

The Educational and General budget of the SUS is also defined as a single budget entity even though this budget represents a consolidation of the resource requirements of all nine public universities in the state. The budget request process for the E&G budget is an example of a mixed budget model. This budget has characteristics of a zero-base formula-oriented model for instruction and research programs while incorporating an incremental approach to funding certain support functions.

Finally, the Auxillary Enterprises of the SUS are budgeted as a single budget entity for all nine universities based upon an incremental approach in the request budget.

These brief examples of the SUS budget process show the diversity and centralization of the process at the level of the governing Board of Regents.

As a result of the aggregated budget for the SUS in past years, the role of the Office of Institutional Research in the budget process at USF has been limited to ad hoc data requests for enrollment data and projections, support software to implement salary allocations under collective bargaining agreements, and other supporting activities. When one is developing a budget request for all academic programs of nine universities in a single consolidated budget, there is, by necessity, the requirement for a highly centralized process at the level of the governing board.

Therefore, in recent years, the staff of the Board of Regents rather than the Offices of Institutional Research have been the focal point for the development of the legislative request budget.

However, the SUS is in the process of implementing a program budget model for the upcoming 1981-83 Legislative Request Budget. In addition, the budget process is being decentralized such that each of the nine universities' budgets will be submitted to the Legislature along with the consolidated budget recommendations of the Board of Regents. The impact of this significant change upon our Office of Institutional Research will be much clearer this coming fall than it is now since the change is being implemented this summer. It is eminently clear, however, that many, if not all, Offices of Institutional Research in the SUS will become much more involved in the institutional budget process.

I can foresee the following eight areas of responsibility for an Office of Institutional Research in the coming years:

1. The identification of programs and activities that can be appropriately aggregated in the state-wide program structure for higher education. This will require specific knowledge of all institutional programs and their interrelationships in order to achieve a clear and concise program structure in the Legislative Budget Request. Further, it will be necessary to retain several levels of detailed information subordinate to the program structure such that once a legislative appropriation is made the university can track the appropriation back from the program structure to the original program budget request submitted at the campus, college, department, and academic program level.

2. The monitoring of the status of academic program reviews, new and revised academic programs, and the impact upon the program budget structure and the entire budget format. This will require some Offices of Institutional Research to be much more involved in the information flow concerning academic program planning than previously required.

3. Development of specific cost per unit information keyed to the program budget structure used in the budget process. This will require some Offices of Institutional Research to become much more familiar with state and national costing procedures and their use within a program budget structure.

4. Analysis of budget requests from the various colleges and administrative areas and compiling and consolidating this information at the campus level for inclusion in the University Legislative Request Budget.

5. Assist the university in identifying and structuring specific budget issues that bridge various colleges, campuses, or functions within a university.

6. Development of program budget statements and supporting data to aid in the preparation of the overall University Legislative Budget Request. This includes but is not limited to, quantitative data and narrative support of existing programs, new proposals and major enhancements or expansion. This overall effort would include supporting data to justify changes due to internal and/or external circumstances.

7. Identification of equity issues in resource between various academic programs and campuses of the university. The resource allocation process must be compatible with and supportive of the university's role, scope and mission. Internal allocation or reallocation of support funds substantiated by university-wide established priorities must be identified and addressed. The Offices of Institutional Research should be actively involved in this process.

8. Identification of pertinent informational systems and procedures to support the program budget process. This role of the Institutional Research Office will probably be extremely significant in future years as the Legislative Request Budget, the state appropriation, and the internal university allocation system are integrated to produce the annual operating budget of the institution.

In summary, I believe that Offices of Institutional Research will become as important to the overall budget process in the next decade as the computer became in the past decade. The real challenge will be to assume this increasing responsibility without losing perspective and deviating from the primary mission of the office.

Toward Principles of Postsecondary Education Funding
by Pat Barrett

The Joint Commission on Postsecondary Education, meeting between sessions of the Legislature, included budgeting as a topic of concern. Currently, university, professional schools and community college budgets are allocated in a number of ways, from lump sums to direct appropriations. The FTE-driven funding is a good approach in a time of growth, but there is some disparity when some institutions in the state are static, some are declining and some are growing. The task is to look carefully at the methods of appropriation.

When the Legislature asks of institutions, "If we give you five dollars more, what have we purchased?" it is difficult to trace that five dollars through the educational system. One FTE counselor does not necessarily mean one body sitting there. Much more information needs to be reduced to terms simple enough not to lose the point but to facilitate understanding.

The following are issues we should be concerned with in postsecondary education funding:

1. The use of formulas and other budgetary processes which generate and allocate funds to each type of postsecondary institution (universities, community colleges and vocational centers) should be based on comparable factors.

2. Similar programs should be funded by the same formulas and other budgetary processes regardless of the postsecondary institution conducting the program.

3. There should be two major components of the funding formulas or other budgetary processes, namely:

    a. Basic Funding - this component should be be used to fund the basic level necessary to continue the operating of existing and on-going programs.

    b. Enhancement Funding - this component should generate funds to enhance priority programs in order to develop higher levels of quality, to provide for new programs, and to provide funding not met in the basic funding process for special purposes.

4. The funding formulas and other budgetary processes should be based on the fixed and variable concepts of cost and should include mechanisms to use these concepts whenever applicable.

5. The funding formulas and other budgetary processes should be based on factors which relate directly to the program being funded.

6. The funding formulas and other budgetary processes should be based on factors that reflect different resource requirements.

7. For those program formulas which use FTE as a basic factor, funding should be based on a multiple year enrollment plan.

8. The allocation of funds to the institutions should be based on the same factors used in the formulas and other budgetary processes to generate the funds although the level of detail may vary.

9. The use of funds at the institution should reflect the program resource requirements upon which funds were generated and allocated.

10. Policies should be established with respect to the proportion of funding to be provided from student fees.

(These remarks should not be interpreted as the view of the Legislature or of the Joint Commission.)

Reshaping the Dialogue
by Bill Shade

There has been a dramatic change in the goals of postsecondary education in Florida. The previous goal was one of expansion of access. The new goal is one of improved quality. Different kinds of questions are being asked, including what kinds of quality education are being bought, not just how many students are attending postsecondary institutions.

There is a difficulty in dealing with Centers of Excellence under the current system of formula budgeting. Establishing Centers of Excellence requires specific funds allocated to specific programs, but the system is not set up to handle this and confusion results. There is a need to realize that the budgetary process is a dialogue, and that the dialogue needs to be reshaped.

A significant improvement would be to revise the manner in which the Legislature determines appropriations for postsecondary education. Current levels of funding are primarily determined by the number of students enrolled, a practice which encourages unnecessary expansion of educational institutions and excessive duplication of programs.

In his education proposals for 1980, Governor Graham recommended that this process be replaced by a budget that focuses more directly on the costs and resource needs of specific educational programs. A program-based budget should include information responsive to the following questions:

Why should this program be offered by this institution?

What is the minimum cost to operate this program with a basic core of faculty, and how many students can be accommodated at this level of funding?

How many students are proposed to enroll in this program? If projected enrollment exceeds the number that can be accommodated by base level funding, what factors justify the expanded enrollment?

What objectives are intended to be met by funds requested beyond the base level funding? How can the achievement of these objectives be evaluated by policy makers.

What standards of quality have been determined for this program? What evidence can be presented to ensure that these standards have been achieved?

The answers to questions such as these will enable the executive and legislative branches to determine that programs are adequately funded and that resources are being employed in an efficient manner. Dialogue among all those involved is the approach to answer these questions.

Contributed Papers

Chair: Bruce Mitchell, Coordinator, Planning and Analysis, SUS

(1) Microcomputers: A catalyst for the identification and improvement of quality instruction.

Al P. Mizell, Director of Curriculum Design, Nova University

(2) A proposed taxonomy of educational benefits

Lester R. Ruth, Jr., Director, Planning and Research, Lake-Sumter Community College.

MICROCOMPUTERS: A CATALYST FOR THE IDENTIFICATION AND IMPROVEMENT OF QUALITY INSTRUCTION

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A PAPER PREPARED FOR THE THIRTEENTH ANNUAL FLORIDA STATEWIDE CONFERENCE ON INSTITUTIONAL RESEARCH

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INTRODUCTION

The identification of quality instruction is an extremely important topic in education today. One reason for the increased attention being given to this topic is that there is very little mobility of faculty between institutions. Declining enrollments have led many faculty to zealously guard their tenured positions because it is becoming increasinly difficult to move to new positions. With ths lack of faculty mobility, there is the concern that teaching will become routinized. In other words, established faculty members may "dig in" and teach in a fairly traditional and consistent manner in spite of changing student characteristics and new research on effective teaching. There may be a tendency to eliminate "faculty development" positions and for faculty to do "their own thing" - regardless of the quality of instruction that results. To ensure that the quality of teaching will continue to improve, institutions must recognize the danger and deliberately establish ways to offset the disadvantages of limited faculty mobility.

There are many aspects of faculty development which can be implemented in the public schools (K-12) and in institutions of higher education. For the purpose of this paper, we will concentrate our attention upon one technique which can be used to help identify and encourage quality instruction - the use of microcomputers to simplify the evaluation of teaching.

Many schools regularly evaluate their courses and faculties. The data obtained are usually processed on large mainframe computers on campus or by an outside organization. Agencies such as the Kansas State IDEA System and the Purdue Cafeteria Evaluation System are fairly popular with institutions using outside agencies to handle their evaluations.

It is more difficult for smaller schools to conduct such evaluations due to the expense involved in contracting with outside agencies. If the institution attempts to conduct its own evaluation, an unreasonable amount of time is required to systematically collect, nalyze and interpret the data unless a computer is readily available.

As a result of the automation revolution of the 80's, the availability of relatively inexpensive microprocessors offers the classroom teacher and school administration a unique opportunity to perform tasks which simply weren't practical in the 70's. As Alvin Toffler predicts in his new book, THE THIRD WAVE (1980), microcomputers will soon be an integral part of each citizen's life. Tiny microprocessors are turning up in more and more products. As we have all witnessed, youngsters are becoming intimately familiar with the many possibilities of microcomputers, yet many teachers and administrators use a computer only as a last resort. There is sometimes a feeling that a "professional" is needed to interface between their needs and the mainframe computer in the computer center. It is imperative that institutional researchers help faculty and administrators become familiar and comfortable with the use of microcomputers. The very fact that the faculty member or administrator can interact with the microprocessor suggests that many educators will soon be in a position

where they can be shown how to benefit from the microcomputer's low cost and ready availability. Institutional researchers, faculty development specialists and others like them are in a unique position to help faculty and administrators capitalize on the potential of the microcmputer for improving the quality of education.

The number of microcomputers in homes and schools is growing dramatically. If computers are to be used wisely, educators must be trained so that they are knowledgeable and sufficiently skilled to put microcomputers to the best possible use.

Microcomputers can help improve the quality of teaching as a direct instructional tool, as a teacher aide for management of student records, and by performing a variety of administrative tasks. The Center for the Advancement of Education at Nova University introduced the microcomputer to facilitate the central staffs ability to handle all aspects of student evaluation. These evaluations are conducted on each course and faculty member on a monthly cycle in every C.A.E. course throughout the entire network. Analysis and interpretation of the evaluation data are distributed almost immediately to each instructor by the Director of Adjunct Faculty.

VERSATILITY OF MICROCOMPUTERS

Microcomputers can be used to provide instruction at a high level of quality. However, to understand how this occurs, the reader must be familiar with certain microcomputer terms and concepts. A brief summary of the most essential elements leading to a general understanding of the development, operation and uses of microcomputers is presented in Appendix "A".

Microcomputers incorporate the best features of word processing equipment (i.e. "electronic typewriters") with the capabilities of mainframe computers. As a result of minaturization, today's micromputers contain the power of yesterday's giant IBM machines. These units can be programmed by the user to perform many different functions as needed. Alvin Toffler (ibid.) illustrates the impact that these units will have on us even if we use a microcmputer as nothing more than an electronic secretary:

> "To learn how -- and to speed up my own work -- I bought a simple computer and word processor and wrote the latter half of this book on it. To my pleasure I found I could master the machine in a single short lesson. Within a few hours I was using it fluently. After more than a year I am still amazed by its speed and power.
>
> "Today, instead of typing a draft of a chapter on paper, I type on a keyboard that stores it in electronic form on what is known as a "floppy disk." I see my words displayed before me on a TV-like screen. By punching a few keys I can instantly revise or rearrange what I have written, shifting paragraphs, deleting, inserting, underlining, until I have a version I like. This eliminates erasing, "whiting out," cutting, pasting, stripping, Xeroxing or

typing successive drafts. Once I have corrected the draft I press a button, and a printer at my side makes a letter-perfect final copy for me at vision-blurring speeds."

MICROCOMPUTERS AT NOVA UNIVERSITY

At Nova University, the commitment to attempt to identify and maintain quality instruction was made when the original National Teacher Education Programs (NTEP) were designed by Dr. Robert L. Burke in 1973. Recognizing that adjunct instructors would be an essential element of the program design, it was deemed appropriate for all students to evaluate each course and instructor in which they participated. To ensure that this evaluation was conducted in a systematic manner, a standard evaluation form and process was developed by the NTEP Director of Evaluation, Dr. Edward R. Martino. A copy of this form, as revised, appears as Appendix "B" of this paper.

Initially, all data from the course evaluations were entered into the mainframe computer on Nova's campus. A terminal at the NTEP office was connected through a modem over conventional phone lines. Statistical data were collected from each evaluation form and entered into the computer for analysis. The comments were not entered into the system at that time; however, they were placed on file. These comments could be reviewed in those cases where the statistical data indicated there were potential problems. In the event that the instructor or the Director of Adjunct Faculty felt that special assistance was needed for improvement to occur, the central staff scheduled time to work with the instructor. If remediation was not feasible, the instructor was not rehired. Student input, via the evaluation forms and personal comments, served to alert the central staff that a particular problem might exist.

As experience was gained with the use of the large campus computer, a number of problems became apparent. It was not always possible to have the appropriate tape placed on the computer when it was needed by our staff, tapes sometimes were damaged so the stored information was no longer available, or the computer was fully in use during the time we wanted to enter or access data.

Approximately one year ago, the first IMSAI-VDP42 microcomputer was purchased by Dr. Burke for NTEP administrative use. On an experimental basis, comments made on all evaluation forms in Broward and Palm Beach counties were typed into the microcomputer and later printed out to send to the appropriate instructor. It was soon apparent that the microcomputer was a more reliable and readily accessible tool than the central computer. The microcomputer was always ready for use, it was under the direct control of the operator, a secretary could be quickly shown how to use the system, it was simple to program for special applications, and if a breakdown did occur, the disk could simply be moved to another machine and the work could continue without interruption. Therefore, we developed a computer program for the microcomputer to perform the statistical analysis previously requiring use of the central University computer.

The microcomputer performed the statistical analysis and printout as well as the large computer and with considerably greater efficiency (See appendix "C" for a copy of the statistical analysis). In addition to greater efficiency, other options became available as a side benefit to the use of the microcomputer. Other programs could be used in conjunction with the statistical programs. For example, we decided that the students' comments would be extremely valuable to the individual instructors. We didn't want to simply send a Xerox copy of the comments to the instructor since this might compromise the student's anonymity. We agreed to experiment with the Broward and Palm Beach sites to see if the provision of a typed version of the comments would be worth the extra time it would require. After a few months, the instructors let us know that they particularly appreciated the typed comments. (See Appendix "C" for a copy of the evaluation forms where typical comments are shown.) They felt they got more from those than they did from the statistical analysis. Of course, we felt better with the quantitative data which we could manipulate and analyze. However, we found that we also learned from the written comments. We began to use the statistical data as a flag to alert us to the need to review the comments made about certain instructors with special attention.

Since this experiment was so successful, we decided to devote approximately one day per week to the input of evaluative data and comments from the evaluation forms. We then made arrangements to provide the entire evaluation summary report, including typed comments, to each instructor following the conclusion of each class. It was the use of the microcomputer that allowed us to offer this service throughout the network. As expected, the faculty reported that the detailed feedback was especially valuable to them.

At one point, we experienced an unusually heavy workload during our conversion from the National Teacher Education Programs to the new and expanded Center for the Advancement of Education. Therefore, we decided to delay the processing of course evaluation forms until the reorganization was complete. Instructors began calling to find out what happened to their course evaluations. They requested -- in fact, they practically demanded -- the summaries of the data collected in their course evaluations.

We also took advantage of other capabilities of the microcomputer to send a letter with each copy of the course evaluation summary. We used the word processing capability of the microcomputer to provide us with three different versions of the letter to send to different instructors. In addition to the form letters, we would like to be able to request the addresses of specific instructors and a set of mailing labels. Although not yet in full use, a program called "NAMEADD" is now available on the microcomputer which will soon enable us to print lists of instructors, addresses, courses taught, etc. and it will prepare sets of mailing labels to help speed up the

distribution of the evaluation results.

Our own programs extend the capabilities of the microcomputer beyond the features provided with a word processing unit or obtained through purchased programs. Since PILOT, BASIC and other user-oriented languages are relatively easy to learn, the user can design programs as needed. Some of our staff have acquired this capability. We have also used the gifted high school students employed by the Nova Computer Education Program. These youngsters gain valuable experience in the design and writing of various programs of value to educators.

Take a moment now to re-examine the course evaluation form (see Appendix "B"). Notice that demographic questions appear first and there are multiple-choice questions on the course, on the instructor and on the instructional methods. On the reverse side of the form, specific open-ended questions have been provided. Comments made in response to these items appear to be the most valuable portion of the form for many instructors. As mentioned earlier, instructors tend to rely heavily upon these reactive comments as a guide to areas which they need to consider for revision. The evaluations also serve as a check on the success of new teaching techniques, materials, etc, which instructors have used during the course. This feedback, which is made possible through the use of the microcomputer, serves as a catalyst for the changes in the evaluation of an instructor.

How well does the evaluation form serve the instructor? Does the quality of instruction change over time? When an instructor teaches a course for the first time, a period of acclimation is required. It takes a little time to plan a new course, to become familar with a new group of students and to become acquainted with a series of new administrative processes. As may be obvious from our earlier statement, we believe that the use of student evaluations, on a systematic basis, is of value to the instructor and to the institution.

We believe that the use of the microcomputer serves as a catalyst to make the evaluative process possible and, it thus, facilitates the identification and improvement of quality instruction. However, does the evaluation process really make a difference? In the literature, one finds that student evaluations do bring about changes if follow-up is provided for instructors - especially where deficiencies exist between the instructor's self-evaluation and the student's evaluation. (Hoyt, Others). Perhaps by looking at excerpts from a series of evaluations for an instructor we can see how change did take place in a least one actual case.

Instructor "M" taught his first class for Nova in the all-day Saturday format in March, 1979. While teaching this course, "Selection and Evaluation of Learning Materials (CU 518), he realized that the students were noticably different from the pre-service graduate students he had taught at another major university in the midwest. These differences were significantly large enough that many of the materials he attempted to use were completely unsuccessful. The evaluation results clearly showed that this teaching experience had been poor. See Appendix "C" for an excerpt from the evaluation summary for CU 518.

The Nova central staff met with the instructor and helped him remediate a number of the problems. Since the problems seemed to stem from a lack of familiarity with the intensive study format and the level of sophistication of practicing educators, the instructor was given another class to teach after he had about six months to prepare for the experience. As may be seen from the evaluation summary in Appendix "C" for CU 515 ("Design of Learning Materials"), the students gave a much better evaluation this time. Now that the trend for improvement was established, how would the next class go? In CU 661, there was a chance to find out (see Appendix "C" for CU 661 - "Oceanology"). A positive response was now evident. After teaching several sections of "The Preparation of Inexpensive Instructional Materials" (CU 643), it was obvious that the instructor had made a complete turn-around and quality instruction was now underway. While it is important to identify both good and poor instruction, we serve our institutions even better when we can help identify specific areas which can be improved so that the instructor can grow professionally. Central staff monitoring of the projects and exams submitted by this instructor confirmed that his courses were rigorous with extensive assignments - just as had been done in the first class. However, he had learned how to approach the students so that they knew what was expected and how they would be graded. They perceived his grading criteria as fair and valid.

Thus the microcomputer can serve to catalyze the identification of poor instruction as well as quality instruction. But, in addition, it can help lead to the improvement of teaching and the professional growth of instructors.

THE FUTURE

In the area of evaluation, microcomputers can bring sophisticated techniques into every school - regardless of size. Once the microcomputer is installed, it can be used for a variety of purposes to serve the teacher and the administrator in better meeting the needs of students. With the growth in computing power becoming available each year - without an increase in cost - it is likely that the future will bring many new uses to us that we haven't begun to consider. The microcomputer revolution is upon us and it will affect our lives in many ways.

In Appendix "D", there is a reprint of an article, "Microcomputers: The Greening of Education" by Robert L. Burke. This article helps us look to the future and challenges us to think of ways we can plan to use the new technology in our work as we seek to improve education. We encourage you to be creative in your thinking and to join your colleagues in letting the manufacturers know what we need the next generation of microcomputers to do for us. Thus we will become the catalysts for the identification and improvement of quality instruction.

LIST OF APPENDICES

Appendix "A" - "Computer Literacy"

Appendix "B" - "Standard NTEP Evaluation Form"

Appendix "C" - "Instructor M Evaluation Summaries"

Appendix "D" - "Microcompuers: The Greening of Education"

APPENDIX 'A'

'BASIC COMPUTER LITERACY'

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After reading the following summary, you may wish to skim two of the PDK FASTBACKS (#52 & #58) and two paperback books (RUNNING WILD & THE HOME COMPUTER REVOLUTION) which will provide additional basic information.

'COMPUTER LITERACY AND CURRICULUM DESIGN'

OVERVIEW

The term,'computer literacy', merely means to have a basic understanding of what computers are, how they work, and how you might be able to use them.

In this summary, you will be given a general introduction to the world of computers with an emphasis on the little (micro) computers and their languages.

INTRODUCTION TO COMPUTER LITERACY

'Silicon Valley' - south of San Francisco - has spawned a revolution. You may want to look at pages 46-47 of THE HOME COMPUTER REVOLUTION for more information on the 'Silicon Valley' or 'Silicon Gulch' as it is sometimes called). This revolution is a result of the semiconducter industry. Semiconducters are electronic circuits built on tiny pieces of silicon. This industry has made discovery after discovery, improvement after improvement. The resulting breakthroughs and price reductions have reduced the complexity and the cost of a 1959 room-sized computer from a half-million dollars to a $5 chip that will fit on your fingernail.

This massive change is termed a revolution because it wasn't predicted or planned. Large companies failed to see what was coming and how they could capitalize upon it. Surprisingly, many entrepreneurs have taken chances and grown rich - while others tried and failed. What is this microcomputer that is the source of such a revolution?

THE MICROCOMPUTER

The primary component of the first computers was the vacuum tube. These early computers usually filled an entire room and required special cooling and humdity control. The transistor, the printed circuit board and then the integrated circuit were developed which led to the amazing reduction in size that we are witnessing today. In 1975, the first microcomputer was produced. A microcomputer may be defined as a general purpose computer that is 1) small, 2) not very expensive and 3) easy to use (Doerr, C., MICROCOMPUTERS AND THE 3 R'S: A GUIDE FOR TEACHERS, 1979, PAGE 2). Microcomputers have not become widely available for educational purposes in the past due to their high cost and the special conditions the large machines needed. Complexity, lack of appropriate teacher training, lack of curriculum materials for the computer and a lack of significant research also tended to slow down the use of computers in education.

The processor, which is the heart of any computer, is smaller than a dime; it will fit on your fingernail yet it is the brains of the machine. This microprocessor, or CPU (central processing unit) controls the rest of the system and performs the calculations as needed. The second major component of the computer is memory. Memory size is usually referred to as bytes of memory. A byte consists of eight bits in the microcomputers we are using at Nova at this time. A bit is the smallest unit that can store information (i.e., 0 or 1) in memory. The most common unit of memory size is the kilobyte which is approximately one thousand (actually 1,024) bytes of memory.

ROM and RAM are two other common terms used in reference to computer memory. ROM stands for 'read-only memory'; it is implanted in the computer when it is manufactured so the computer always has access to these basic commands. This makes it easier for us to operate the computer. ROM cannot be erased and changed once it is installed. However, recently, PROM has been used in some

machines. PROM means you can program your own permanent memory; in fact there are now some erasable PROMs (EPROMs).

RAM, meaning 'random-access memory, is designed for temporary storage of the program being used at the time. It can also be used to store data while you work with it but it can be cleared and reused whenever you want.

Since only one program is usually stored in the computer's memory at a time, there has to be some way to keep copies of the programs you want use at other times. You also must have ways to store all of the data you put into the computer and the variety of changes (manipulations) you make with that data. Magnetic tape is commonly used. In a microcomputer, this tape is stored on an audio cassette. Tapes are read sequentially. In other words, you have to go through a lot of tape to get to the point you want. This can take a lot of time. A second method of data storage is to use a disk. In a microcomputer we tend to use floppy disks. They can be accessed randomly - just like putting a needle down on a record whereever you want it. This is a faster method of locating information.

Input and output devices (I/O) are the gadgets you use to get information into and out of a computer. Examples of I/O devices include terminals, keyboards, light pens, graphic boards, printers, video screens, joy sticks, etc.

To make the computer work, a computer program must be written in language the machine can understand or it won't know what to do. A program is a set of instructions that tell the computer what calculations to carry out and what to do with the results. There are many different languages in use; BASIC is the language which is most frequently found on a microcomputer today. The letters, B-A-S-I-C, stand for 'Beginner's All-purpose Symbolic Instruction Code.'

How does one communicate with a computer using a computer language? Are there many other languages? BASIC is only one of the computer languages. Computer programming languages have undergone a series of developmental stages since the first computers were built. Each stage has made computers easier to use and made them available to a larger circle of specialized users. The first language consisted of strings of '0's' and '1's'. This initial version was called a machine language because it was intelligible only to computers and to very few people other than those who built computers.

The first improvement to computer programming languages was the 'assembly language'. The assembly language really gave rise to the specialized profession of computer programming. Assembly languages are mnemonic. That is, they are written in terms that make sense to humans. For example, 'MV' might stand for 'move'. Each assembly language instruction must be 'assembled' into a machine language instruction (0's and 1's) before the computer can execute it.

The second large improvement to computer programming was the compiler language. Compilers are great time savers for programmers because each instruction may 'compile' into several machine language instructions. For example, the command 'SQRT' would cause the compilation of a series of machine language instructions which would find the square root of a number. Compilers typically are designed for a certain broad category of applications, FORTRAN for mathematics, COBOL for business and accounting applications and so forth.

A third stage is the meta language which is typically more specialized. Examples would include PILOT for computer assisted instruction and DYNAMO for simulation applications.

Each succeeding language is said to be 'higher level' or 'more powerful'. Certain disadvantages come with higher level languages. They are often slower and less flexible than lower level languages. However, their one advantage

outweighs all of the disadvantages. From the material you have just read, can you see what that one main advantage is?

The advantage of high level languages is that they are easier to use because they are more like English. However, they are less flexible than the lower level languages for the same reason.

Programs written in computer languages are referred to as software. Software includes all of the programs which are used on the microcomputer. On the other hand, hardware refers to the actual devices that input, process, and output information. As you found during the first part of this workshop, computers have decreased greatly in size and price since the days of the vacuum tube and transistor. The heart of a computer system is the central processing unit (CPU). The integrated circuit (I.C.) that has allowed the size of the computer to be reduced so drastically is smaller than your fingernail. The microelectronic circuit, or integrated circuit, when encased in a plastic housing with a number of metal connecting leads, may be known as a microprocessor. There are a number of different integrated circuits for various purposes - some are designed to be the central processing unit (CPU) while others have different specialized purposes.

Since all of the calculating and processing logic of a computer can be reduced enough to fit in a single tiny microprocessor, it is possible to make very small calculators which require very little electricity to operate. Look at the inside of your own pocket calculator if you have an inexpensive one that you can open; they usually still work when closed up again. The black rectangular piece of plastic you see is the microprocessor. If this microprocessor was connected to a few other items and housed in a 'black box', we could call it a microcomputer.

There is a brief synthesis of the things we've said about the micro in Appendix "A" (p. 149) in the book, RUNNING WILD. If you locate a copy of this book, you might skim "A Worm's Eye View of Microelectronics".

EDUCATIONAL USES

As you may have begun to suspect, the microcomputer has tremendous potential for education. It is relatively inexpensive and the cost is still dropping almost daily. Manufacturers are beginning to recognize the need to design hardware and software expressely for educators. More educators are being exposed to computers and they are becoming potential purchasers of microcomputer for use in their own classrooms. Programming is becoming simplified to the point that it is possible to learn the basic operations within a few weeks of concentrated study. A few colleges and universities are beginning to offer courses geared to the needs of educators.

At Nova University, the Center for the Advancement of Education(CAE), the Office of New Programs, the Criminal Justice, Marketing, Computer Education and the Corporate College programs all use microcomputers for curriculum design and administrative purposes. Their use of the central university computer has been greatly reduced with many resultant advantages to the individual centers. Let us look at the use of the microcomputer for curriculum design in the CAE for a few moments.

At CAE, we provide each instructor with a fairly complete instructor guide to the graduate course he/she has been hired to teach. These guides contain the objectives, content outline, suggested approaches and master copies of student resource material which the instructor can xerox. If you are interested the in the process we use for guide production at Nova please contact the authors who will be happy to share sample guide materials and a pamphlet describing the process with you.

As a person involved in curriculum design, you might suspect that systematic

revision of material is an on-going occurrence. While we routinely collect data on the success and areas of trouble in these materials, we do not have the time or clerical help needed to constantly revise and retype these mater- micro-computer. While we still don't have the system down pat, we are no longer reluctant to make changes in those guides which we have had time to retype into the microcomputer for storage on a disk. We can call up the make We then just press a button or two to have the revised version of the guide printed out at high speed without any typographical errors. It is now ready to xerox and be used in place of the previous guide.

THE FUTURE

What is the future going to be like for the use of microcomputers? Will they put you out of work? Will they create new jobs? Will they really help education? Can you become part of the shaping of the future? Each writer has a unique set of predictions for the future. Many share the belief that the current series of price reductions for microcomputers will soon cease. We are reaching a lower limit due to labor costs because materials cost very little now. However, we should continue to see a continual increase in the power of the units we purchase for the same price. We will continue to get more for our money. We will see microprocessors being used more and more. Schools will be in the forefront of the movement if educators become aware of the potential and take the time to investigate ways they can use microprocessor technology. For the first time, educators can join together to have a voice in the shaping of the future if they will take the trouble to become interested. Manufacturers are in a mood now to listen to our needs if we voice them loudly enough.

ADDITIONAL INFORMATION

Where can you get more information on the use of microcomputers? There are at least two sources. One is from reading a published bibliography. Most books on microcomputers have a bibliography included. For example, you can look at pages 108-112 in the book, COMPUTER ASSISTED PLANNING OF CURRICULUM AND INSTRUCTION by James E. Eisele, 1971 for a list of suggested readings. A number of graduate students have also begun to prepare annotated bibli- ographies. One company produces an annual bibliography of readings on microcomputers for less than $8 a copy. You should now look at pages 41-42 of the PDK FASTBACK #82 to see another example of such an annotated bibli- ography. ERIC also recently produced a series of six annotated bibliographies on the microcomputer in conjunction with a workshop on microcomputers given at the April 1980 AECT annual convention in Denver (Hizell and Burke). Copies of these bibliographies follow this appendix.

This concludes your brief introduction to the world of computer literacy. You may be interested in a series of videotapes on the topic. There is an interesting videotape on Personal Computing and another tape series from EDI titled: 'Little Computers...See How They Run'. These videotapes are designed to bring your level of computer literacy into better focus. Contact the authors for company names and addresses.

When you come to Fort Lauderdale, you are invitied to visit our micro- computer lab at Nova University where you can see teachers and administrators in the process of acquiring a working knowledge of microcomputers for use in education.

Appendix B

FT: 4/78

ANSWER BELOW BY BLACKING IN BETWEEN DOTTED LINES

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NOVA UNIVERSITY NTEP COURSE EVALUATION

Please mark you responses with a No. 2 or softer pencil IN THE SPACES AT THE RIGHT. Please be both fair and honest in your responses as the continued improvement of the program depends on the feedback that you and other participants are able to provide to us at Nova.

1. **Sex: (optional) 1. Male; 2. Female.**
2. **Ethnic Background: (optional) 1. White American; 2. Black American; 3. Hispanic; 4. American Indian; 5. Asian; 6. Other.**
3. **For this course, the all-day Saturday format is: 1. Better than the traditional semester; 2. Just about right; 3. A bit too rushed at times; 4. Other.**
4. **The outside-of-class workload in this course has been: 1. 1-5 hours/week; 2. 5-10 hours/week; 3. 10-15 hours/week; 4. 15-20 hours/week; 5. over 20 hours week.**
5. **The instructor's grading policies were: 1. too lenient; 2. just right; 3. too harsh.**
6. **The class has met for the scheduled number of hours: 1. all the time; 2. most of the time; 3. less than ½ the time; 4. never met for scheduled hours.**
7. **Class homework assignments are: 1. just right; 2. confusing at times; 3. too long for time frame and objectives; 4. sometimes long but appropriate; 5. too short (not enough depth); 6. other; 7. combination of ____ & ____.**
8. **The physical facilities have been: 1. excellent; 2. good; 3. fair; 4. poor. (note specific problems) _____**
9. **I would recommend this instructor to friends or other students needing this course: 1. most definitely; 2. probably; 3. as a last resort; 4. no way.**

Please rate each characteristic of this course and instructor against the background of prior graduate work (where possible) and assign it a grade as follows below. Please remember to answer in the grid above. Thank you.

1	2	3	4	5
Outstanding	Clearly Above Average	Average	Clearly Below Average	Poor

10. **The instructor's knowledge of the material.**
11. **The instructor's ability to present the subject in practical ways.**
12. **The instructor's personality and style (dynamic, motivating, pleasant, etc).**
13. **The instructor's preparation for and organization of each class.**
14. **The instructor is easily approached by students.**
15. **The instructor's clear statement of the course objectives.**
16. **The course's overall theme and scope.**
17. **The relevance of the curriculum for the working educator.**
18. **The instructor encourages class participation appropriate to the course content and structure.**
19. **The instructor's ability to establish a tension-free, democratic, student-centered atmosphere.**

Course Name/Number _____ **Location** _____

Date _____ **Instructor** _____

Please use this side of the questionnaire to make additional explanatory comments in the following areas:

Area #1: The instructor (pro, con, constructive suggestions).

Area #2. Course content, text, lectures, discussion, etc. (pro, con, constructive suggestions).

Area #3: Course administration such as assignments, scheduling, exams, grading, etc. (pro, con, constructive suggestions).

Area #4: Thoughts, feelings, reactions, experiences I have had related to this course. (Please make any additional comments here.)

Thank you for your time.

N o v a U n i v e r s i t y
3301 College Avenue
Ft. Lauderdale, Florida 33314

National Teacher Education Programs
Robert L. Burke, Ed.D., Director

Course Evaluation Feedback Form
Pro, Con, and Constructive Suggestions

NAME: INSTRUCTOR M
COURSE:CU518
SITE: West Palm Beach
CYCLE: (January 1979)

AREA #1: (The instructor) 'TOO MUCH work required. Instructions not clear. Too Many handouts and too much to absorb in such short time. Constantly changing the course objectives. Students feel lost and confused.'(1)* 'It was obvious that the instructor is not a full time teacher. His expectations were unrealistic for people who are working full time and are not just students.'(2) 'Very willing to adjust and meet individual needs.' (4) 'New instructor, needs time to adjust to teaching.'(5) 'Was very perceptive to the kind of materials that were appropriate to the students in the class after the first meeting.'

AREA #2: (Content, text, lectures, discussion, etc.) 'The discussions and lectures were too long and had no meaning to individual and real situations.'(1) 'Was inappropriate for a general type course. May be good for media people.'(2) 'I was confused by some of the terminology (my fault, not the instructor's). We as a class were not as advanced as Instructor M assumed.'(3) 'The course work was totally irrelevant to me as a classroom teacher. (4) 'Confusing.'(5) 'Too rushed. Too much material to absorb in such a short period of time.' (10) 'The content was practical in that we can use the kind of knowledge and experiences provided.'(6)

AREA #3: (Assignments, scheduling, exams, grading, etc.) 'Too long and too confusing. Unsure of what instructor wanted of me.'(11) 'Absolutely too many assignments and they are too long. The objectives and assignments are not clear and are contradictory.'(1) 'Confusing.'(5) 'Assignments are not clear.'(10)

AREA #4: (Thoughts, feelings, reactions, experiences) 'I feel that there was too much work required for this course. Objectives need to be clearer and simplified.'(1) 'I would rather have had something more practical.' (10) 'I felt a lot of growth took place in me as a teacher.'(6)

* Please note that the number in the parentheses corresponds to the student who is making the comment.

Nova University
3301 College Avenue
Ft. Lauderdale, Florida 33314

National Teacher Education Programs
Robert L. Burke, Ed.D., Director

Course Evaluation Feedback Form
Pro, Con, and Constructive Suggestions

NAME: Instructor M
COURSE:CU 661
SITE: Broward
CYCLE: (August 1979)

AREA #1: (The instructor) 'All instructors were helpful, enthusiastic and made the course as interesting as possible!'(1)* 'Iinstructor M was well organized and demonstrated phenomenal patience and calm in the face of impolite personnel in Largo and in the face of uncontrollable circumstances, i.e. 'boat'. The substitute of canoes was brilliant as it afforded closer observation of the area and specimens.'(2) 'The instructor did a super human effort to coordinate this course.'(3) 'Informative and excellent class rapport.'(4) 'Very warm, relaxed, opened to questions and good curriculum suggestions. Encouraged questions and class discussion. He encouraged me to re-read and go further in curriculum design.'(5) 'Very pleasant manner. An easily approachable and friendly character -- he made a tremendous effort and his input into this course is highly commendable.'(7)

AREA #2: (Content, text, lectures, discussion, etc.) 'The course was appropriate and relevant to the subject matter.'(1) 'Lectures were outstanding with one exception -- the summary. All others were fantastic.'(2) 'The varied topics related to the area of oceanology were superior. The different methods were very successful.'(3) 'Outstanding lectures, well planned and interesting activities, time for discussions and the discussions were constructive.'(4) 'The course was very well arranged.'(5) 'More time to be spent getting names, addresses and materials.'(8)

AREA #3: (Assignments, scheduling, exams, grading, etc.) 'All superb!'(2) 'The administration of this course was challenging but very capably handled.'(3) 'Everything seemed equitable.'(4) 'Assignments were fair. I haven't seen the exam yet.'(5) 'It was clarified after the second day.'(8)

AREA #4: (Thoughts, feelings, reactions, experiences) 'It was a great experience for learning about oceanology.'(1) 'This course stimulated the scientifically inclined as well as interested outsiders. Each had the professional opportunity to absorb as much as the individual was capable. There was much more to absorb, leaving none bored. The activities were fantastic. Thanks ever so!'(2) 'Great course!'(3) 'Fantastic, however I wish we could have stayed in the Keys longer. Saturday plans were great.'(9) 'This was a fantastic experience. It increased my awareness of the importance of the ocean and its environment. This was a well-formulated and implemented course.'(4) 'It was a very useful and stimulating experience. 'I liked the course!! It's a pleasure!'(7) 'Great enthusiasm and enjoyment of learning.'(8)

* Please note that the number in the parentheses corresponds to the student who is making the comment.

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February, 1980

Microcomputers: The Greening of Education

Robert L. Burke, Ed.D.
Director, National Teacher Education Programs
Nova University

The availability of inexpensive but powerful microcomputers permits users to have immediate contact with their equipment. This has resulted in a profound increase in new, practical and cost effective applications. Here are some of the economies which can be achieved through microcomputer-enhanced communication in education.

Introduction

Higher education must become more efficient. The cost of education is skyrocketing and exceeding available resources of more and more Americans. The amount of knowledge to be assimilated in a college education is growing exponentially. It is now being demonstrated that microcomputers can increase the efficiency and effectiveness of persons engaged in the educational process.

Education involves a very special kind of communication. By adding the microcomputer to the process, one can improve the quality and efficiency of the process manyfold. Rather than dehumanizing the educational experience as computers are traditionally accused of doing, microcomputers have already shown themselves to be capable of enriching and enhancing education by improving the efficiency of human communication in education.

The microcomputers that are now available have more capability at a fraction of the cost than the computers which revolutionized business practices in the fifties. All indications are that the cost of these small computers will continue to decrease and their capability will continue to increase. This is one factor that has contributed to their more widespread use. Another is the greater simplicity of operation. They are, in the conventional parlance of the computer world, "friendlier."

The availability and simplicity of use has brought about a subtle, but very significant change in the relationship between user and computer. Up until microcomputers came on the scene, it was standard procedure to have a coterie of specialists surrounding the computer.

Given this array of "experts," and the high developmental costs of applications, software and programs (not to mention the high cost of operation), it's no wonder that only "important" applications were implemented. The applications had to be "cost effective" and usually had to be standardized to be capable of cost amortization over a large set of users.

Microcomputers, which are incredibly inexpensive compared with earlier computers of similar power, allow the user to be in constant contact with the computer. As a result, the array of new applications is increasing at an exponential rate, ushering in a new era of computing.

Some of the most interesting applications of microcomputers derive from their ability to communicate with each other. For example, one microcomputer can be connected with another over a standard telephone line; what is typed and displayed on the one can be made to appear almost simultaneously on the other. At this simplest level messages can be typed and passed back and forth between the units almost as fast as they are typed. Theoretically, this network can be extended to any number of microcomputers, the same message occurring on each screen. Every microcomputer can maintain, on diskette, a complete record of all messages which have been sent. This model works at all distances: across a room, throughout an institution, between cities, states and nations.

Applications

The efficacy of this technology has already been demonstrated in many ways.

BRAINSTORMING - At Nova we have used microcomputers to facilitate, and indeed, to augment brainstorming. We found that participants become much more task oriented and more ideationally fluent. The efficiency of the computer-augmented brainstorming method is much greater than traditional brainstorming methods. Most brainstorming models require two sessions; in the first session, all judgments are withheld in order not to inhibit ideational fluency. The second session usually involves critique and culling of the product out of the first. By separating the two sessions in time, participants do not feel so personally attached to a given idea and can therefore be more objective in dealing with it. Using micros, a one-step model can be used effectively. Since it is not obvious who authors which ideas, there is less tendency to operate politically or to be overly protective of one's ideas. Creative productivity in some aspects of curriculum development, which by previous methods might have required four-to-six weeks, can now be accomplished in less than a week.

COMPUTER CONFERENCING - In several places in the country, microcomputers are being used over telephone lines to conduct conferences on various

technical or professional topics. In this application, a variety of scientists for example, can communicate with each other simultaneously by preparing messages or questions in the local mode and then sending them via communications to all other communicants at once. Any of the other scientists can then prepare a response to the first message, capture the network link and make his response known to all other participants.

Since the scientists are in their own labs and local working environments, they can consult local resources such as data, files, colleagues, or favorite reference books if needed to make a response. In this way responses can be much more informed, accurate and complete. As opposed to conference telephone calls, with computer conferencing, any amount of time required can pass before a message is responded to. Conferences can take place over minutes, hours, days, weeks, or continously, as required.

For economy, if toll calls are involved, then messages can be sent during certain predetermined short intervals or on a polled basis. Messages can be left on diskettes with instructions for the microcomputer to dial the phone and transmit to other units at night or during lowest rate periods.

There is little practical limit to the size of messages which can be sent, from one-word responses to entire papers. If the microcomputers are properly equipped, graphics and other exhibits can also be transmitted.

This modality can be used to replace all sorts of conventional means of professional communication. For example, it can be used as a sort of "electronic mail" to replace the services of the post office. Many scientists have mailing lists of several hundred colleagues to whom they regularly send draft papers and reprints, "fugitive literature" if you will. It can serve as an "electronic journal." Papers, in effect, are instantly "juried" and by a much wider group of peers than might otherwise be the case. The distribution is immediate, and paper-by-paper rather than by formal publication.

These are just two applications, both in their infancy, which have arisen as a result of the proximity of microcomputers and their users. I believe it can readily be expected that many new applications will occur.

SCENARIO - I would like to suggest a scenario for a small college. Each faculty member and each student would have his own microcomputer. Courses would not need to be confined to any specific time schedule such as courses usually are. Instead, each course could go on continuously throughout the semester or year. The professor could send out messages which might correspond to lectures. Students could decide to receive them immediately or at another time of their own choosing. Students could question the professor or ask for clarifications and examples through the system. The professor could take the time necessary to answer questions in a complete, accurate manner including references and examples where appropriate. The public record created by this process would be available to benefit all students, many of whom might have had the same questions.

Homework assignments can be sent through the system. Students would work out assignments on the network. The system could be designed to let professors "look in" on each student individually to keep a check on progress and to offer assistance. Homework assignments can be made available to the professor through the system, without the need for paper. Because the material is in digital form, the professor can program the computer to check certain aspects of the work such as key words and terms, references used, spelling, some aspects of grammar and syntax as well as other aspects we can't imagine at this moment.

The text-writing and editing efficiency of the microcomputer will ease the mechanical burden of typing and retyping written products of student and professors alike. Some authors estimate that the microcomputer doubles their rate of output capacity.

Through the use of microcomputers, students can do library research or information retrieval from 100 or more sources throughout the United States. In many schools, students have available to them no less than 97 data bases for research purposes right at this moment.

It is not necessary that professors be resident at the host campus in order to conduct a course with that student population. He could be anywhere in the world and still maintain the necessary dialog to conduct this kind of course. It is also not necessary that all of the students be at the same school. They too could be anywhere in the world and could be enrolled at a variety of institutions.

Students could be expected to do greater amounts of more relevant homework because of the added efficiency of the microcomputer system. Students could access larger and more powerful computers on their campus or elsewhere. In that way large projects could be assigned requiring programs and data files which would not fit in their microcomputers or for which their microcomputers were not fast enough.

Since each student could study in his dormitory room, a library, his home, his place of employment, or nearly anywhere, there would be little strain on facilities effecting an economy in physical plant requirements as well as transportation.

Conclusion

Familiarity with microcomputers combined with their ubiquity will result in uses impossible for anyone to imagine at this time. One can expect though that there will be a large increase in the use of interactive computer-assisted instruction as well as testing.

The economies to be achieved by the application of microcomputers in ways such as those described here will permit us to accommodate increasing costs and accumulation of knowledge in such a way that we may preserve our most important educational values, which might otherwise be irretrievably lost. ■

A PROPOSED TAXONOMY OF EDUCATIONAL BENEFITS

Preliminary Version

Lester R. Ruth, Jr., Ed.D.
Lake-Sumter Community College

Thirteenth
Florida Statewide Conference on Institutional Research
Tallahassee, Florida
June 13, 1980

A PROPOSED TAXONOMY OF EDUCATIONAL BENEFITS

Preliminary Version

Introduction

Since the advent of educational accountability, the major focus has been on fiscal accountability. In 1971, Dressel listed among the forces shaping higher education "public resistance to higher education budgets;" "a shift to large-scale, low-cost education away from small college (high cost and presumed quality) systems;" and "demands for cost benefit or cost effectiveness studies" (1). The same year the Florida community college system began implementing its cost analysis (2). The reasons are not hard to find. Fiscal accounting is essential to any operation that consumes resources; thus financial accounting systems were already in place in higher education institutions. Furthermore, commercial enterprises had already developed sophisticated cost accounting systems that could be adapted to educational institutions. Such financial systems involve highly developed structures for classifying income, expenditures, and costs (3).

Recently, however, the emphasis has been shifting from finances to "quality," or outcomes. In 1973 and 1974 NCHEMS developed and validated an inventory of outcome measures (4). The emphasis on placement and follow-up studies by the federal Vocational Education Data System, recently implemented, is another indication of interest in one aspect of educational quality. Even more recently the special subcommittee of the

Florida Community College Coordinating Board has been formed to study quality education.

Such efforts are hampered by the lack of a clearly defined structure or methodology for assessing quality such as exists for fiscal accountability. Financial accounting systems are comprehensive, covering most if not all aspects of financial operations. Not so for systems concerned with evaluating quality. Confusion has resulted from the plurality of definitions (or lack of definition) of quality caused by the plurality of educational philosophies and the many points of view of the publics concerned with education. What may be conceived as an educational benefit from one viewpoint may be seen as a cost or liability from another (5).

Perhaps a partial solution to this problem lies in the development of a classification structure for kinds of educational quality, or benefits, a related concept. The nebulous meaning of quality may possibly be rendered less nebulous by defining it in terms of benefits. Education may be said to be quality education to the extent that it produces benefits. A classification system is fundamental to the systematic study of any subject. Such a system, sometimes called a taxonomy, is closely related to definitions of the terms used in the subject and thus is an important factor in accurate communications. It also helps to identify various elements of the subject and in locating elements that have already been classified. By clarifying relationships among the elements, a tax-

onomy serves as an aid to inference and research. (6)

A number of classification structures related to education have been developed. Perhaps best known is the Taxonomy of Educational Objectives produced by Bloom, Krathwhol, and others. NCHEMS has produced a Program Classification Structure and an Inventory of Outcome Variables and Measures. All of these are purposely limited in scope: the Taxonomy to the outcomes of instruction and the NCHEMS structures to the institutional viewpoint. A taxonomy of educational benefits needs to be broader; it needs to include other points of view.

The purpose of this project was to develop a classification system, or taxonomy, of educational benefits. A taxonomy is more than just a classification system. The prototype taxonomy is that of the biological sciences used in classifying all living things. The American Heritage Dictionary defines taxonomy as "the science, laws, or principles of classification." Dressel, in a critique of the Taxonomy of Educational Objectives, says that a taxonomy should be composed of mutually exclusive, clearly differentiated categories; should be comprehensive enough "...to provide bases for all possible decisions;" should use categorical labels consistent with existing usage; and should have a structure that defines relationships among the categories. Cohen and Nagel distinguish between two kinds of classification systems, the natural and the artificial. The latter is based on arbitrarily selected characteristics; the former on inherent characteristics shared by members of the

same class. Those traits should be selected which prove most fruitful as principles for attaining systematic knowledge. The basic process for developing a classification system is division. They cite three rules of classification:

1. A division must be exhaustive.
2. The constituent species of the genus must exclude one another.
3. A division must proceed at every stage upon one principle, the fundamentum divisionis.

They add, however, that these rules express an ideal and that they are inadequate for a well-developed science. For one thing, we can never be sure that subaltern genera (subcategories, or constituent species) are mutually exclusive or that the division is exhaustive, for another. (7) As a science develops two changes appear to occur. First, the basic process becomes one of aggregation rather than division. Second the fundamentum divisionis may change, often resulting in a restructuring of the classification system. The third rule may be violated in another way: more than one principle may serve as a basis for classification. (8)

For the purposes of this project, taxonomy was defined as a method of classification and a classification structure, the primary purpose of which is to provide fruitful principles for attaining systematic knowledge through the appropriate selection of characteristics on which the classification is based.

Closely related to classification is definition, the process of assigning terms to the categories of a taxonomy

or vice versa. One of the differences between "natural" and artificial systems is the relationship the former have to definitions per genus et differentia. Such definitions have three parts: the term being defined, the class to which the term belongs (genus) and the characteristics that distinguish it from other members of the same genus (differentiae). The differentiae are to definitions what the fundamenta divisionis are to taxonomies.

Methodology

The methodology consisted of three major steps. First, a survey was conducted of selected existing classification structures for the purpose of developing taxonomic principles and design criteria. Second the results of the survey were used to construct a preliminary classification structure. Third the classification structure was evaluated against the design criteria and the results used to make or suggest modifications in the structure.

Results

The classification structures surveyed and the evaluations are summarized in Table 1. Each structure was evaluated against the following criteria: (1) the use of a single classification principle on each level; (2) mutually exclusive genera; (3) comprehensive subject matter; (4) the definition of interrelationships among genera. The purposes of the classifications were also included in the analysis as were the major classification principles. They are summarized in Table 2.

Table 1 Survey of Selected Classification Structures: Evaluations

Name of Classification Structure Source	Single Principle for each Level?	Mutually Exclusive Genera?	Comprehensive Subject Matter?	Generic Interrelationships Defined?
Biological Taxonomy: Life Lanham, "Mapping the Living World," Origins of Modern Biology (1968), ch. 7	no	yes	yes	yes
Chart of Accounts (NACUBO) Planning, Budgeting and Accounting: A College Operating Manual, Section II (1970), pp. II-84 - II-101.	no	no	yes	yes
Cost Accounting: Costs Horngren, Cost Accounting: A Managerial Emphasis (1977), pp. 4, 24-25, 28, 34, 497.	yes	no	yes	yes
Costs and Benefits of Higher Education Mosher, "The Development of a Cost-Benefit Model for Higher Education" (1972), pp. 75-82.	?	no	no	yes
Goals of Education (Florida) Education Policy for the State of Florida (1975), p. 3.	no	no	?	?
Higher Education Measures Higher Education Measurement and Evaluation Kit (1972).	no	no	?	yes
Library of Congress Classification Immroth, A Guide to the Library of Congress Classification (1971).	yes	yes	yes	no
Program Classification Structure (NCHEMS) Gulko, Program Classification Structure (1972).	yes	yes?	yes	yes
Program Measures (NCHEMS) Topping and Miyataki, Program Measures (1973)	?	?	yes	yes

Table 1 Survey of Selected Classification Structures: Evaluations (Continued)

Name of Classification Structure Source	Single Principle for each Level?	Mutually Exclusive Genera?	Comprehensive Subject Matter?	Generic Interrelationships Defined?
Social Benefits of Higher Education Dressel, Handbook of Academic Evaluation (1976), pp. 76-77.	yes	yes	?	?
Socioeconomic Impact of Two-Year Colleges Alfred, Socioeconomic Impact of Two-Year Colleges (1980).	no	no	yes	yes
Student Goals Student Goals Catalog and Handbook for Utilization (1976).	yes	no	?	yes?
Taxonomy of Educational Objectives Bloom, Krathwhol, and others, Taxonomy of Educational Objectives (1956, 1964).	yes	no	yes	yes
TOTAL NUMBER OF YESSES	6	4	8	10

Table 2 Survey of Selected Classification Structures Subject Matter and Principles

Classification Structure	Purpose, Subject of Structure	Major Principles of Classification
Biological Taxonomy	Identification of living things	Plants/Animals Structures related to function, adaptation
NACUBO Accounts	Provide financial control and information	Purpose of funds Sources of funds Type of financial behavior
Cost Accounting	Costs	Method of allocation Cost objective
Costs, Benefits of Higher Education	Costs and Benefits of higher education	Costs/Benefits
Goals of Education	Goals of Education of Florida	Subject matter Purpose
Higher Education Measures	Evaluate effectiveness of programs and institutions	Input/Output/Process
Library of Congress	File and locate printed materials	Kind of material Subject of material
NCHEMS Program Classification Structure	Common functional operations of institutions of higher education	Program objectives
NCHEMS Program Measures	Program measures	Program Kind of outcome
Social Benefits of Higher Education	Social Benefits	Private/Social Production/consumption
Socioeconomic Impact of Two-Year Colleges	Socioeconomic impact measurement	Social/economic Individual/community
Student Goals	Student goals	Type of development
Taxonomy of Educational Objectives	Educational objectives	Types of behavior Complexity of behavior

Classification systems were selected for variety--some non-educational ones were included--and for their usage. Some of the criteria presented difficulties. Classification principles were not always clear. At times a single characteristic or measure was used for several categories; however, this did not necessarily indicate a lack of mutual exclusion unless it was the characteristic or measure itself that was being classified. It is often difficult to judge whether the subject of the taxonomy is covered comprehensively. Nevertheless, the survey was useful in setting up design criteria and in developing the categories of a taxonomy of educational benefits.

The following design criteria were selected:

I. Purposes of the Taxonomy
   1. Clarify meanings of terms associated with educational benefits
   2. Facilitate communication among groups interested in educational benefits
   3. Promote and facilitate research about educational benefits

II. The Taxonomy
   1. Categories based on definitions
   2. Consistent classification principles on each level
   3. Generic interrelationships defined
   4. Consistency with present educational classification structures
   5. Comprehensive coverage of educational benefits
   6. Simplicity

III. Definitions
   1. Consistent with taxonomy
   2. Based on current usage
   3. Per genus et differentia
   4. Based on innate characteristics (properties) of terms being defined.

The first term defined was <u>educational benefits</u>, as "'Anything that promotes or enhances well-being' (9) of a group or individual and that is produced by an educational delivery system." Thus the term implies a recipient, a beneficiary, and well-being to be enhanced: physical, financial, psychological, personal, political, cultural, and social. Promotion or enhancement may be defined in terms of meeting needs or satisfying desires. Products, needs, and desires may all be expressed in terms of goals and objectives. Thus a more productive definition, in terms of the taxonomy, is " a product of an educational system: (1) the achievement of a goal or objective, (2) progress toward the achievement of a goal or objective, or (3) assistance in the achievement of a goal or objective, including the goals and objectives of individuals, groups, and educational delivery systems."

This definition and characteristics implied by it provide the basis for the taxonomy. Characteristics were selected for each level of the structure to provide a logical or productive ordering of genera. The major categories were based on kinds of beneficiaries, since what may benefit one individual or group may not benefit--may actually cost--another (10). The major divisions are: (1) consumers: private, (2) consumers: public, and (3) producers (educational delivery systems). The second division was by subgroups of beneficiaries, usually ordered from smallest to largest. The third was as direct or indirect. A direct benefit is achievement or progress toward

achievement of a goal or objective. An indirect benefit is assistance toward the achievement of a goal or objective. The acquisition of a marketable skill may be direct or indirect, depending on whether the student's goal is to acquire the skill or obtain a job. The fourth level categorizes benefits as long- or short-range, following a similar classification of goals and objectives. The fifth level is variable, depending on goals, objectives, or programs of various subgroups of beneficiaries.

An analysis of existing educational program and goal structures and of evaluation measures and methods was used to complete the fifth level and to partially validate the the taxonomy by providing examples of benefits, which were implied by the programs or goals and by the measures. As a result, the fifth level was moved up to third, changing the ordering of categories as follows: (1) beneficiary, (2) beneficiary sub-groups, (3) variable, (4) direct/indirect, and (5) long-range/short-range. The revised taxonomy with examples of benefits and measures of benefits is found in appendix A.

Evaluation and Conclusions

The taxonomy was evaluated against the design criteria. The results are summarized in Table 3. By defining the term educational benefits and the categories of educational benefits, the taxonomy should help to clarify meanings and thus facilitate communication. This, however depends on the extent to which

the taxonomy is actually used. The clarification of meanings should also help to facilitate research. The taxonomy suggests

Table 3 Evaluation of the Taxonomy

Purposes		**Taxonomy** (Continued)	
1. Clarify meanings?	Yes	4. Consistent with existing educational structures?	Yes
2. Facilitate Communication?	Yes?	5. Comprehensive	Yes?
3. Promote, facilitate research?	Yes	6. Simple	?
Taxonomy		**Definitions**	
1. Based on definitions?	Yes	1. Consistent with Taxonomy?	Yes
2. Consistent classification principles?	Yes?	2. Based on common usage?	Yes
3. Generic Interrelationships defined?	Yes	3. *Per genus et differentia*?	Yes
		4. Based on innate characteristics?	Yes

areas in which research might be fruitful: identification of benefits, measurement of benefits, identification of benefits common to more than one category (overlapping categories), and prehaps a restructuring of the Taxonomy.

The method of development insured compliance with most of the other criteria. For example, using existing structures in the development and partial validation of the taxonomy helped to assure consistency with those structures, comprehensive coverage of the subject, and definitions based on common usage. The use of definitions *per genus* and *differentia* helped in the definition of generic interrelationships.

This taxonomy is only a start. It needs to be used. It needs to be tested through use and revised as needed. As it is revised and expanded it will realize its potential for

improving communication among various entities concerned with education and for providing concepts and stimuli for institutional and other research projects.

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APPENDIX A

TAXONOMY OF EDUCATIONAL BENEFITS

Lester R. Ruth, Jr.

Summary

Private Beneficiaries

- Students/Graduates
  - Personal Benefits
    - General
    - Physical Health
    - Psychological and Emotional Health
    - Personal Growth
    - Financial Benefits
  - Academic Benefits
    - Recognition and Credentials
    - Knowledge, Skills Attitudes, Values
    - Education Options
    - Personal Benefits
  - Career Benefits
    - Goal Setting
    - Knowledge, Skills Attitudes, Values
    - Satisfactory Employment Credentials
    - Financial Benefits
  - Cultural Benefits
    - Avocational
    - Aesthetic
  - Social Benefits
    - Status
    - Campus Activities
    - Social Skills
  - Community-Related Benefits
    - Citizenship and Politics
    - Development
    - Service
- Employees of Educational Delivery Systems
  - Financial Benefits
  - Career Benefits
  - Academic and Cultural Benefits
  - Social Benefits
  - Community-Related Benefits
- Families of Students, Graduates, and Employees
  - General Benefits
  - Academic Benefits
  - Financial Benefits
- Clubs, Associations, etc.
- Commercial Enterprises
  - Financial
  - Personnel
  - Development

TAXONOMY OF EDUCATIONAL BENEFITS

Summary

Public Beneficiaries

- General Public
  - Citizenship
  - Development
- Local Community
  - Social
  - Developmental
  - Economic
  - Service
- Public Agencies
  - Personnel
- Governments, General
  - Taxpayer Benefits
  - Cost Avoidance Benefits
- Governments, Local
- Governments, State
  - Florida
    - Basic Skills
    - General Education
    - Vocational Competencies
    - Professional Competencies
    - Advanced Skills and Knowledge
    - Research and Development
    - Leisure and Recreation Skills
- Federal Government
  - Vocational
  - Social

TAXONOMY OF EDUCATIONAL BENEFITS

Summary

Educational Delivery Systems

- Institutions
  - General Academic Instruction
  - Occupational/Vocational Instruction
  - Developmental Instruction
  - Community Instruction
  - Instruction, General
  - Organized Research
  - Community Service
  - Academic Support
    - Learning Resources
    - Museums and Galleries
    - Other Support
  - Student Services
  - Institutional Support
  - Independent Operations
- Groups or Systems of Institutions

Beneficiary Categories Benefit Categories	Examples of Benefits	Long Range = L Short Range = S	Direct = D Indirect = I	Examples of Measures
PRIVATE BENEFICIARIES **Students/Graduates**				
Personal Benefits				
General	Values	LS	D	Student/graduate perceptions
	Leadership Skills	LS	D	Number of students/graduates holding office
	Persistence			
	Ability to plan and execute, to organize one's time, to follow directions			
	Self-Discipline			
Physical Health	Few Illnesses	LS	D	Number of students/graduates reporting illnesses
Psychological and emotional health	Personal adjustment to changed circumstances	S	D	Number of students/graduates reporting emotional or psychological problems
	Reduction of frustration	LS	D	
Personal growth	Strengths	LS	D	Student/graduate perceptions
	Self-worth	LS	D	
	Self-confidence	LS	D	
	Self-understanding	LS	DI	
Financial Benefits	Non-market (from "doing it yourself")	LS	DI	
	Consumer	LS	D	
	Financial management	LS	I	

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L Short Range = S	Direct = D Indirect = I	Examples of Measures
PRIVATE (Continued)				
Students/Graduates (Cont)				
Academic Benefits				
Recognition, Credentials	Degrees, Certificates, Honors, GPA's, Licenses	S	DI	Number awarded GPA
Knowledge, Skills Attitudes, Values	Cognitive competencies	SL	DI	Test scores
	Affective competencies	SL	DI	Student/Graduate perceptions
	Psychomotor competencies	SL	DI	Test scores, performances
	Combination competencies	SL	DI	
Education Options	Option of additional education	L	D	Graduates/leavers who continue their education
Personal benefits	Satisfaction of curiosity	S	D	
Career Benefits				
Goal setting	Choice of realistic career goals	L	D	Number of students identifying career goals
Knowledge, Skills, Attitudes, Values, etc.	Cognitive competencies	SL	DI	Test scores
	Affective competencies	SL	DI	Student/graduate perceptions
	Psychomotor competencies	SL	DI	Test scores
	Combination competencies	SL	DI	
Satisfactory Employment	Entry-level employment	S	D	Number of graduates/leavers employed
	Satisfactory performance on job	L	D	Job retention

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L / Short Range = S	Direct = D / Indirect = I	Examples of Measures
PRIVATE (Continued)				
Students/Grads. (Cont'd)				
Career (Continued)				
Satisfactory Employment (Ctd.)	Job Satisfaction	L	D	Graduate/Leaver perceptions
	Promotions	SL	D	Number of graduates/leavers promoted
	Career change	S	D	
Credentials	Degrees, certificates, licenses, etc.	S	D	Number awarded
Financial Benefits	Income earned	L	D	Starting salary Present salary
Cultural Benefits				
Avocational	Interests and related competencies	S	D	
Aesthetic	Appreciation, enjoyment	SL	D	Perceptions of persons involved
	Production, performance	SL	D	
Social Benefits				
Status	Fulfillment of social aspirations	SL	D	
Campus activities	Interaction with a a variety of people	S	D	
	Participation in athletics/recreation, organizations			
Social Skills	Group-related competencies			

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L / Short Range = S	Direct = D / Indirect = I	Examples of Measures
PRIVATE (Continued)				
Students/Graduates (cnt)				
Community				
Citizenship and Politics	Knowledge of rights, priveleges, responsibilities	LS	D	Number of students/graduates who vote
	Attitudes, values, beliefs	LS	D	Student/graduate perceptions
Development	Knowledge of the "system"	LS	D	
	Skills for community involvement and problem solving	LS	D	Number of students/graduates holding public office
Service	Preparation for volunteer service	L	D	Hours devoted to such service by graduates
Employees of Educational delivery systems				
Financial	Income	LS	D	Salary
Career	Job satisfaction	LS	D	Employee perceptions
Academic and cultural	Opportunities	LS	I	Employee participation in academic and cultural activities
Social	Status	LS	I	Employee perceptions
Community	Service opportunities	LS	I	Employee involvement in community activities

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L Short Range = S	Direct = D Indirect = I	Examples of Measures
PRIVATE (Continued)				
Families (Graduates, Employees)				
General	Improvement of organizational structure	LS	I	
Academic	Informal education received at home by children	L	I	
Financial	Income	LS	D	Family income
	Consumer competencies	LS	D	
	Financial management	LS	D	
Clubs, Associations, etc.				
Commercial Enterprises				
Financial	Purchasing power of students graduates employees	S	D	Student expenditures Increased income Payroll of delivery systems
Personnel	Manpower supply	LS	D	Workers trained or educated
	Increased productivity	LS	D	
Development	Improved competitive-for government contracts	LS	I	Contracts awarded
	Application of new knowledge	LS	I	Knowledge, discoveries, invenactually used

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L Short Range = S	Direct = D Indirect = I	Examples of Measures
PUBLIC BENEFITS				
General Public				
Citizenship	Better citizens	L	D	Voter turnout Reduced crime rate
Development	New knowledge	L	I	Publications, copyrights, patents
	New art forms	S	D	Exhibitions, performances, publications
Local Community				
Social	Absorption of under-developed learners	S	I	
	Reduction of human waste	LS	D	
Developmental	Attraction of new industry	L	DI	Number of new industries locating in community
	Population stabilization and growth	L	D	Population statistics
Economic	Purchasing power of educational delivery systems, students, employees	LS	D	Total expenditures
	Reduction of unemployment	S	D	Employment data
Service	Extension, personal, and other services	S	D	Community use of services
	Cultural and recreational	S	D	
	Educational	SL	D	
	Use of facilities	S	D	

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L / Short Range = S	Direct = D / Indirect = I	Examples of Measures
PUBLIC (Continued)				
Agencies				
Personnel	Increased productivity	LS	D	
Governments, General				
Taxpayer	Taxes paid by graduates and employees	LS	D	Amount of taxes
Cost avoidance	Fewer welfare recipients	SL	D	Number of graduates on welfare
	Lower law enforcement costs	SL	D	Number of graduates arrested
Governments, State Florida				
Basic Skills General Education Vocational Competencies Professional Competencies Advanced Skills and Knowledge Research and Development Recreation and Leisure Skills	Meet the needs of individuals, of Florida, of society related to these various kinds of competencies	L	D	
Government, Federal				
Vocational	Employment of completers, leavers	S	D	Employment status of completers and leavers of occupational programs

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L Short Range = S	Direct = D Indirect = I	Examples of Measures
PUBLIC (Continued)				
Federal Government (Continued)				
Vocational (Cont'd)	Income to completers and leavers	LS	D	Salary of completers, leavers
	Quality of training	LS	D	Employer perceptions
	Continued education of completers/leavers	S	D	Educational status of completers/leavers
Social	Acess to education by minorities, women, handicapped, elderly	LS	I	Number enrolled
Others				

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L; Short Range = S	Direct = D; Indirect = I	Examples of Measures
EDUCATIONAL DELIVERY SYSTEMS				
Institutions				
General Academic Instruction	Completions	S	D	Degrees, certificates awarded Course completions
	Continued Education	L	D	Former students who continue their education
	Employment	L	I	Employment status of former students
	Financial security	L	I	Salaries earned by former students
Occupational/Vocational Instruction	Completions	S	D	Degrees, certificates awarded Course completions
	Continued Education	L	I	Former students continuing their education
	Employment	L	D	Employment status of former students; Job performance; Relation of job to instruction
	Financial Security	L	I	Average salary of former students
Developmental Instruction	Continued Education	S	D	Educational status of former students, GPA's, course and program completions
Community Instruction	Solutions to community problems	S	D	Number of problems solved
	Avocational benefits	S	D	Number of people benefitting
Instruction, General	Acquisition of knowledge skills, attitudes, values, etc. by students	LS	D	Enrollments, Test Scores

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L Short Range = S	Direct = D Indirect = I	Examples of Measures
EDUCATIONAL DELIVERY SYSTEMS (Continued)				
Institutions (Cont'd)				
Organized Research	Publications	LS	D	Number of publications
	Inventions	LS	D	Number of inventions
	Scientific Discoveries	LS	D	Number of discoveries
	Artistic, musical, dramatic, literary productions	LS	D	Number of Productions
Community Service	Services to people	LS	D	Number of people served
	Services to organizations	LS	D	Number served
Academic Support				
Learning Resources	Access to print and non-print materials	LS	DI	Numbers served: students, staff, community members
Museums and Galleries	Access to cultural and scientific exhibits, etc.	LS	DI	Numbers served: students, staff community members
Other support	Computer assisted instruction	S	D	Students served
	New, improved courses and curricula	SL	D	Number of improvements Enrollments
	Administration of instructional programs	SL	D	Number of programs
Student Services	Social/cultural development	SL	D	Number of activities Number of students served
	Counseling, guidance	SL	DI	Number of students served
	Financial aid	S	I	Amount of aid, number served
	Food service	S	I	Number served

Beneficiary Categories / Benefit Categories	Examples of Benefits	Long Range = L Short Range = S	Direct = D Indirect = I	Examples of Measures
EDUCATIONAL DELIVERY SYSTEMS (Continued)				
Institutions (Continued)				
Student Services (Continued)	Placement in jobs	S	DI	Employment status of graduates
	Student workers	S	I	Number of assistants
Institutional Support	Appropriately allocated resources	SL	I	Sufficient resources for each unit of the institution
	Long and short-range plans	SL	I	Extent to which the insti- fulfills its mission
	Management information	SL	I	Amount of information, use of information
	Physical facilities	SL	I	Adequacy of facilities
	External funding	S	I	Amount of funds, Number of grants
	Community support	L	I	Community perceptions of the institution
Independent Operations	Revenue	S	I	Amount of income
Groups or Systems of Institutions				

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ESSENTIAL ACADEMIC SKILLS PROJECT: PROGRESS REPORT

September 15, 1980

by Margaret Maney, Director
Essential Academic Skills Project
Department of Education

(Progress on the project was so rapid that the editor has chosen to use the director's report of September 15, 1980 as a better indication of results than the report available at the June conference.)

Competency-based education continues to be the subject of interest and concern among the nation's educators. Increasingly, attention is being directed toward the part the achievement of essential academic skills plays in a student's success at the college level.

In 1979 the Florida Legislature enacted CS/HB 1689, a bill designed to improve the quality of postsecondary education in Florida. Charged with those provisions of the bill designed to ensure that students moving from one level of education to the next acquire the skills necessary for success to the baccalaureate, the Articulation Coordinating Committee established in August 1979 the Essential Academic Skills Project. Each of the four component groups of this project has its special function, and each has accomplished specific tasks in order to complete the first phase of the project's work. The functions, tasks, and interrelations of these component groups, together with projected future activities, are described below.

1. THE EXECUTIVE COMMITTEE AND THE DIRECTOR

The project executive committee and the director coordinate and supervise the activities of the project. Shelley S. Boone, Deputy Commissioner for Special Programs and Chairperson of the Articulation Coordinating Committee, also chairs the executive committee of the project. Representing the State University System on this committee is Paul Parker, Associate Vice Chancellor for Academic Programs. Representing the Community College Division is Myron Blee, Bureau Chief, Bureau of Program Support and Services.

Committed to the principle that the goals of the project should be attained primarily by faculty of the state's postsecondary system, the Articulation Committee solicited from the thirty-seven public community colleges and universities nominations for faculty members to serve on the project. Margaret Maney, of the Communications Division at Broward Community College, was appointed project director and began her duties in Tallahassee on November 1, 1979.

2. THE STATE LEVEL TASK FORCE

Function. By December 15, 1979, twenty teachers drawn equally from the universities and the community colleges were selected from the many highly qualified nominees to serve on the two teams--communications and computations--which comprise the state task force.

Essential Academic Skills Project

The state teams have a twofold task. (1) They must identify the essential communications and computations skills needed by entering freshmen so that these students may receive admissions counseling before entering college credit programs. (2) They must identify those communications and computations skills students completing their first two years of college need to succeed in upper division programs. The competencies must be defined with a sufficient degree of specificity to make clear that they are (a) teachable, (b)learnable, (c) measurable.

Activities to Date

State Level Task Force Meetings I, II, III. The communications and computations teams met for three day sessions in January, March, and April of 1980 to accomplish the arduous but challenging task of generating the lists of essential skills. After careful review of HB1689, they studied competency statements produced by institutions, projects, consortia, and professional organizations both within and outside the state of Florida. Then, using their best professional judgment as college teachers, they compiled lists of communications and mathematics skills which represented their best initial thinking.

Survey 1. A preliminary survey based on the first draft of the skills was sent in February 1980 to the thirty-seven postsecondary institutions in the state. Faculty respondents were asked to indicate the extent of their agreement that the listed reading, listening, writing, speaking, and mathematics skills were essential for all college students. Surveys returned in March indicated a faculty consensus ranging from 80 to 99 percent that the listed skills were essential. Of the over 2,600 faculty who completed surveys, one thousand offered written comments for the state teams to consider.

The Interim Report on Essential Academic Skills for Florida Community Colleges and Universities. In June 1980 the state task force published through the State Department of Education a sixty page report on the decisions and findings of the members at their second and third meetings. Edited by the director with the assistance of the Communications Chairperson, Marian Bashinski of Florida State University, and the Computations Chairperson, Etta Mae Whitton of Tallahassee Community College, this report represents a second--and far more comprehensive--competency statement.

The Interim Report contains a brief history of the project's inception, a definitive statement on the meaning of "essential skills" arrived at collectively by the task force, glossaries of working terms, definitions of the global skills, taxonomies for the communications and mathematics skills, and detailed lists of those skills arranged according to competencies, sub-competencies, and specific enabling skills and sub-skills. In addition, two appendices--one for communications and one for mathematics--offer the suggestions of the task force for assessment procedures and provide examples of problems illustrating the requisite level of difficulty for the communications and mathematics skills.

Because the scope of the overall task is so broad, and working

time was so limited, the state task force decided to limit its task during the first phase of the project's work to identifying the communications and computational skills which students should have mastered upon the completion of their sophomore year. Therefore, the lists of skills and the suggested measurement examples in the Interim Report relate to the "rising sophomore" and the transfer level.

Survey 2. Based directly on the Interim Report, Survey 2 was sent to the institutions on September 15, 1980. Five thousand copies of the Interim Report accompanied by a survey questionnaire for each have been distributed. Far more complex than the first, tentative survey, Survey 2 asks Florida postsecondary faculty to indicate the extent of their agreement on fifty-seven communications skills and sixty-five computations and mathematics skills considered to be essential at the "rising sophomore" level. Based on the results of Survey 2, the state teams will prepare the final draft of essential skills for this level.

THE INSTITUTIONAL TASK FORCES

Function. While the Executive Committee was soliciting nominations for the state teams in August and September of 1979, it was concurrently encouraging academic administrators in the public postsecondary institutions to set up home task forces composed of faculty drawn from all the academic disciplines. By January 1980, these task forces were in place,and their coordinators or co-coordinators had been identified.

These institutional task forces function as advisory committees to review their own curriculum concerns and to interact with the state level task force in the effort to reach statewide consensus on the essential skills. The institutional coordinators enlist the assistance of the task forces in administering the surveys generated by the state teams; equally important, the coordinators serve as liaison persons between their faculties and the director of the project.

Activities to Date

Institutional Task Force Meeting I. On February 1, 1980, coordinators, their faculty representatives from communications and mathematics departments, and other interested persons met in Tampa with the project executive committee, the director, and the twenty members of the state level task force. Dale Mabry Campus of Hillsborough Community College was host to this full-day workshop during which ninety educators discussed provisions and implications of HB1689, functions and products of the Essential Academic Skills Project, and the initial lists of competencies generated by the state teams. This meeting was the nucleus for an ever-widening participation of faculty and administrators statewide in the efforts to make public the problems and progress in the matter of establishing competencies for academic work.

Essential Academic Skills Project

Survey 1. Fully understanding the time constraints under which the state task force was working, the institutional coordinators and their task forces and faculties received the first survey, duplicated, distributed, collected, and returned to Tallahassee over 2,600 surveys, and did so within the three weeks required so that the state task force could consider the results for its next meeting.

Institutional Task Force Meeting II. Between June 2 and June 19, 1980, the director traveled around the state to confer with the institutional task forces in eight regional meetings. Over four hundred faculty, administrators, counselors, and other interested educators attended these meetings to study the Interim Report, to consider the future work of the project, and to prepare for the administration of Survey 2 in their own institutions. At these meetings the participants gave a close and considerate hearing to the work of the state task force, offered cogent suggestions, and volunteered continued cooperation for the coming tasks. These eight meetings helped to broaden the information base for the project and to continue the interchange between the university and the community college sectors of our state system.

Survey 2. Survey 2, sent to the colleges and universities by the director on September 15, will be returned to Tallahassee for data analysis by October 24. Academic administrators are assisting the institutional coordinators in the administration of the survey in two distinct sections and for two distinct purposes.

(1) A statistical survey is based on a random sample of eight hundred faculty drawn from broad discipline areas. The purpose of this "statewide" survey is to provide the state task force with a statistically correct sample which is representative of faculty reaction across the state to the skills identified as essential for student performance in baccalaureate programs.

(2) An institutional survey is being administered to faculty members at each institution who are sufficiently interested in the pedagogical implications of competency identification and assessment to review on a "voluntary" basis the work of the state task force and thus to provide that body with an overview of faculty reaction on an institution-by-institution basis. The purpose of this survey is to disseminate information about the findings of the task force beyond the limited statistical sample and to enlist faculty consensus in the broadest possible way. Institutions may receive the data analysis of their own faculty if they wish to have that information.

THE STANDING COMMITTEE ON STUDENT ACHIEVEMENT

Function. Criterion referenced assessment practices are extremely important to competency-based programs because they qualify and quantify the extent to which the essential skills have been taught and/or reinforced by instructors and mastered by students. While the state and institutional task forces are primarily responsible for identifying these essential skills, the Standing Committee

Essential Academic Skills Project

has the responsibility of assessing them.

Robert Stakenas, Associate Director of the Center for Needs Assessment and Planning of Florida State University, was appointed Chairperson of the Standing Committee on Student Achievement in March 1980. By April 1980 the full committee, which consists of three educators from the universities and three from the community colleges, was in place. All have expertise in curriculum development, measurement, and evaluation.

Activities to Date

Consultants to the State Task Force. To assure close articulation between the competency identification process and the assessment measures development process, two members of the newly formed standing committee worked with the state task force at its second and third meetings. Robert Stakenas, consultant on national competency identification projects, gave the task force an in-depth presentation on competency based programs from conceptualization to actualization. With Ernest Ross, he assisted the task force in interpreting the data from Survey 1, in revising taxonomies of of skills and subskills, and in developing rationales for inclusion of skills. As chairperson of the standing committee, Dr. Stakenas strongly encouraged the task force to provide the examples of the assessment problems found in the Interim Report so that the standing committee, when it begins to review means of assessing the skills, has a clear picture of what faculty believes to be reasonable and workable in assessment procedures.

Plans for Phase 2 of the Essential Academic Skills Project. By June 1980 the standing committee had planned its strategies for accomplishing its important threefold task of (1) ascertaining the kinds and the extent of testing for placement and for essential skills already in existence at the colleges and universities, (2) identifying tests and other means of measuring the achievement of essential skills listed by the state task force, (3) initiating procedures for the preparation of status reports on student achievement of essential skills in public institutions of higher education in the state of Florida.

Appointment of a Staff Director. Paul Gallagher, member of the standing committee, has agreed to serve as staff director for the project while on leave from the College of Education at Florida International University. He arrived in Tallahassee on September 1, 1980 and will work closely with standing committee chairperson Stakenas and project director Maney in coordinating the numerous coming activities of the project.

BROADENING THE INFORMATION BASE

All concerned with the Essential Academic Skills Project are mindful of the need to disseminate as widely as possible information about the project and its activities on behalf of quality education

in Florida public postsecondary institutions. The director, often with the chairperson of the standing committee and whenever possible with the chairpersons and members of the state task force on communications and computations, has appeared before conferences, professional associations, and faculty groups to discuss the work of the project. Presentations include those given before the Council of Academic Vice Presidents, the Florida Association of Admissions Officers and Registrars, the Faculty Senate Forum, and the Board of Regents of the State University System, and before the Council on Instructional Affairs, the Council of Student Affairs, and the Coordinating Board of the Community College Division.

The Florida Council on Essential Academic Skills. In June 1980 the Articulation Coordinating Committee, acting to ensure the ongoing work of the Essential Academic Skills Project and the interaction of its component groups, created this new council. The project director, the chairpersons of the communications and computations task forces, the chairperson of the standing committee on student achievement, and the staff director will serve as the steering committee for the new council.

The Governor's Workshop on Quality Education. On September 3, 1980, the director, on behalf of all the project members, gave a brief presentation to Governor Graham and the Cabinet at a special workshop for discussion of quality education in the community colleges and the universities. The Governor recognized the chairpersons of the communications and computations task forces and commended the work of all those involved in the project.

COMING ACTIVITIES

State Level Task Force Meeting IV. The Communications and Computations Task Force will meet in Tallahassee with the director and members of the Standing Committee on Student Achievement to consider the results of Survey 2 and to compile the final draft of competencies at the transfer level. The director and task force chairpersons will edit this draft and submit it to the Articulation Coordinating Committee for approval on January 1, 1980.

Identification of Entry-level Skills. The State Level Task Force will meet in January, March, and June of 1981 to compile the lists of communications and computational skills considered essential for students entering college credit programs. The survey procedure utilized during the first phase of the project will be used again to obtain faculty consensus on the entry skills. The director expects to submit the final draft of entry level competencies to the Articulation Coordinating Committee on June 30, 1980. The executive committee, the director, and the state task force expect to work with high school teachers of communications and computations in the identification process.

When the Articulation Coordinating Committee approves the lists of entry-level skills, the Standing Committee on Student

Achievement will find tests and other means of measuring the skills.

Broadening the Network. The director will continue to appear before those councils, conferences, and professional organizations which need to be informed about the project and which, in turn, have valuable input for the project. Requests for information are invited. Write or call Margaret Maney, Director, Essential Academic Skills Project, c/o English Department, Broward Community College, 3501 S.W. Davie Road, Ft. Lauderdale, FL 33314, Phone 305-475-6634 or Suncom 469-6634.

Members of the Essential Academic Skills Project are listed on the following page. They, too, are resource persons for providing information about the work of the project.

CONTINUING TEAMWORK

The teamwork among the members of the project has gained in effectiveness, and enthusiasm for the work has gained momentum. The executive committee continues to be both flexible and inventive in overseeing the project activities--many of which constitute "firsts" in the state's postsecondary system. The State task force has shown itself to be a group of teaching professionals motivated by intellectual integrity and concern for students. The quantity and substance of the work produced to date is evidence of their dedication to a task they consider essential to quality education. The members devoted many extra hours preparing for meetings; they attended each meeting, and they gave unstintingly of their time assisting the project director. Finally, the task force members have shown their willingness to continue an often difficult and taxing job by responding affirmatively to the Deputy Commissioner's request to continue with the project for another year.

The institutional task forces and their coordinators, administrators, and faculties have shown consistent interest and steady cooperation in their interactions with the director and the state task force. Through these groups the information network broadens and the enthusiasm for strengthening essential skills in college students grows. The standing committee has shown impressive ability to envision and structure its multiple tasks and to work productively with the state teams on communications and computations.

The project is raising the hopes of many faculty members in the colleges and universities that the products of this project will enable them to assure higher levels of student achievement and assist greatly in the improvement of our undergraduate system.

ESSENTIAL ACADEMIC SKILLS PROJECT

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St. Petersburg Junior College
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Trends in Truth in Testing

Are standardized tests valid enough? Are students benefitting as much as they should?

Chair: Melodie Christal, Coordinator, Planning and Analysis, SUS

Thomas Redmon, Assistant Director, The College Board

Margaret Weber, Professional Associate, Educational Testing Service

Gerald Sanchez, Director, University of Florida Students for Legislative Action (presentation cancelled)

Jim Carr, Regional Director, American College Testing

Additional Paper by James Maxey, Assistant Vice President and Director of Institutional Services, ACT

Introduction
by Melodie Christal

Truth-in-Testing is an expression we're hearing more about everyday. The Truth-in-Testing bill is springing up in legislatures all across the nation. To date, New York and California have both passed Truth-in-Testing Legislation. In Florida, the bill extends the concept of Truth-in-Packaging and Truth-in-Labeling to standardized higher education admission tests. It is essentially a disclosure bill. It provides students, parents and educators with information about the standardized tests. It requires test companies to:

1. Disclose all studies of test validity;
2. Inform students of what their scores mean and how they will be reported;
3. Provide the student with a copy of the test, the student's answers, and the correct answers upon request, after the scores have been sent out.

The supporters of the Truth-in-Testing bill believe that this legislation will:

1. Help students understand their scores by telling them how well it predicts future performance;

2. Lessen the inequities created by coaching schools and giving all students equal access to information about the tests and test questions;

3. Detect scoring mistakes;

4. Let students know how their scores are altered before they are reported;

5. Increase test validity by opening test questions to experts in the field;

6. Allow the student to see what they got wrong and to learn from their mistakes.

(Editor's comment: Although Gerald Sanchez was not able to participate in the conference due to a last-minute schedule conflict, some of his work contributed to the relevance of the issue to Florida. He was involved in the preparation of a bill filed for the 1980 Legislative Session. That bill, to which panelists reacted, follows.)

Florida Senate - 1980

SB 937

By Senators Gordon, Williamson and Barron-

A bill to be entitled

An act relating to education; creating s. 240.234, Florida Statutes, relating to standardized testing; providing definitions; providing for background reports and statistical data; providing for disclosure of test contents; providing for notice; prohibiting unauthorized disclosure of individual test scores; providing for rules; providing for fees; providing a penalty; providing an effective date.

WHEREAS, Florida residents desirous of entering postsecondary institutions are subjected to standardized tests, and

WHEREAS, many of the students do well in high school, but are deprived admission to the college of their choice because of low scores on the Scholastic Aptitude Test, and

WHEREAS, individuals failing standardized tests have no redress, no right to review their answer sheets, no provision for argument, no way to indicate when a question seemed biased or misleading, and no information about how their responses to individual questions were scored, and

WHEREAS, the statistical data underlying an entire exam has been entrusted only to authors of tests and selected testing experts, and

WHEREAS, "freedom-of-information" laws and "truth-in-lending" laws exist, and

WHEREAS, the State of Florida operates under and believes in the policy of Government in the Sunshine, and

This public do...ent was promul... at a cost of $8.28 per printed page for 1200 copies to inform the legislature and the public of proposed legislation.

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WHEREAS, the state, without limiting the emphasis that schools place on tests, could alleviate these problems with a truth-in-testing bill, NOW, THEREFORE,

Be It Enacted by the Legislature of the State of Florida:

Section 1. Section 240.234, Florida Statutes, is created to read:

240.234 Truth in testing.--

(1) DEFINITIONS.--As used in this section, unless the context otherwise requires:

(a) "Standardized test" or "test" means any test that is given at the expense of the test subject and designed for use or used in the process of selection for postsecondary school admissions. Such tests shall include, but are not limited to, the Preliminary Scholastic Aptitude Test, the Scholastic Aptitude Test, the ACT Assessment, the Graduate Record Examination, the Medical College Admission Test, the Law School Admission Test, the Dental Admission Testing Program, the Graduate Management Admissions Test, and the Miller Analogies. This section shall not apply to any state, federal, or local civil service test, any test designed and used solely for nonadmission placement or credit-by-examination, or any test developed and administered by an individual school or institution for its own purposes only.

(b) "Commissioner" means the Commissioner of Education of the State of Florida.

(c) "Test subject" or "subject" means an individual to whom a test is administered.

(d) "Test agency" means any individual, person, organization, association, corporation, or partnership, which

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develops, sponsors, or administers a test for use in this state.

(2) BACKGROUND REPORTS AND STATISTICAL DATA.--

(a) Whenever any test agency prepares, causes to be prepared, or provides the data used in any study, evaluation, or statistical report pertaining to a test, such study, evaluation, or report shall be filed with the commissioner.

(b) If any reports or other documents submitted pursuant to this subsection contain information identifiable with any individual test subject, such information shall be deleted prior to submission.

(c) All data, reports, or other documents submitted to the commissioner pursuant to this subsection shall be public records.

(3) DISCLOSURE OF TEST CONTENTS.--

(a) Within 30 days after the results of any standardized test are released, the test agency shall file or cause to be filed in the office of the commissioner:

1. A copy of all test questions used in calculating the test subjects' raw scores.

2. The corresponding acceptable answers to those questions.

3. All rules for transferring raw scores into those scores reported to the test subjects together with an explanation of such rules.

(b) After the test has been filed with the commissioner, upon the request of a test subject made within 90 days of the release of test scores to the test subjects, the test agency shall send to such test subject:

1. A copy of the test questions used in determining the subject's raw score.

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2. The subject's individual answer sheet together with a copy of the correct answer sheet to the same test with questions counting toward the subject's raw score so marked.

3. A statement of the raw score used to calculate the scores already sent to the subject.

The agency may charge a nominal fee for sending out such information, not to exceed the direct cost of providing the information.

(c) This subsection shall not apply to College Board Achievement Tests or Graduate Record Examination Advanced Tests.

(d) Documents submitted to the commissioner pursuant to this subsection shall be public records.

(4) NOTICE.--

(a) Each test agency shall provide, along with the registration form for a test, the following information:

1. The purposes for which the test is constructed and is intended to be used.

2. The subject matters included on such test and the knowledge and skills which the test purports to measure.

3. Statements designed to provide information for interpreting test results, including, but not limited to, explanations of the test score scale, the standard error of measurement of the test, and a list of available correlations between test scores and grades, successful completion of a course of study, and parental income.

4. How the test scores will be reported, whether the raw test scores will be altered in any way before being reported to the test subject, and whether and how the test agency will use the test score in raw or transformed form, by

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itself or together with any other information about the test subject, to predict in any way the subject's future academic performance for any postsecondary educational institution.

5. A complete description of any promises or covenants that the test agency makes to the test subject with regard to accuracy of scoring, timely forwarding of information, policies for notifying test subjects regarding inaccuracies in scoring or score reporting, and privacy of information relating to the test subject.

6. Whether or not the test scores are the property of the test subject, how long they will be retained by the test agency, and policies regarding storage, disposal, and future use of test score data.

(b) Any institution which is a test score recipient shall be provided with the information specified in this subsection. The test agency shall provide such information prior to or coincident with the first reporting of a test score or scores to a recipient institution. Such institution shall be encouraged to provide interpretive processing by qualified personnel where such personnel are available.

(5) DISCLOSURE OF TEST SCORES.--The score of any test subject shall not be released or disclosed by the test agency to any person, organization, corporation, association, college, university, or governmental agency or subdivision unless specifically authorized by the test subject. A test agency may, however, release all previous scores received by a test subject on a test to anyone designated by the test subject to receive the current score. This subsection shall not be construed to prohibit the release of scores and other information in the possession of a test agency for purposes of research leading to studies and reports concerning the tests

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themselves. Such studies and reports shall, however, contain no information identifiable with any individual test subject.

(6) RULES.--The commissioner shall promulgate rules to implement the provisions of this section.

(7) VIOLATIONS; PENALTY.--Any test agency which violates any provision of this section shall be liable for a civil penalty of not more than $500 for each such violation.

Section 2. If any provision of this act or the application thereof to any person or circumstance is held invalid, it is the legislative intent that the invalidity shall not affect other provisions or applications of the act which can be given effect without the invalid provision or application, and to this end the provisions of this act are declared severable.

Section 3. This act shall take effect January 1, 1981.

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HOUSE SUMMARY

Requires every test agency preparing and administering standardized tests for use in this state (such as the Preliminary Scholastic Aptitude Test, the Scholastic Aptitude Test, and the Graduate Record Examination) to:

(1) Submit all background reports and relevant statistical data pertaining to such tests to the Commissioner of Education, which information shall then become a matter of public record.

(2) Submit to the commissioner, within 30 days of the release of test results, a copy of all test questions and corresponding answers, together with rules for transferring raw scores into reported scores, which information shall then become a matter of public record.

(3) Send to the test subject, upon his or her timely request and for a nominal fee, a copy of the test questions used in determining his or her raw score, a copy of the test subject's answer sheet together with a copy of the correct answer sheet, and a statement of the raw scores used to calculate the test subject's reported scores.

(4) Provide to each prospective test subject, along with the registration form for a test, notice as to the purpose of the test, the subject matters to be included therein, the knowledge and skills the test purports to measure, the information necessary for interpreting test results and other score-related information, and as to the

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policies of the test agency with regard to accuracy of scoring, privacy of information relating to the test subject, and retention, storage, disposal, and future use of test-score data.

Prohibits unauthorized disclosure of individual test scores.

Exempts, for purposes of the act, state, federal, or local civil service tests, tests designed and used solely for nonadmission placement or credit-by-examination, and tests developed and administered by an individual school or institution for its own purposes only. Exempts, for purposes of provisions of the act which require disclosure of test contents, College Board Achievement Tests and Graduate Record Examination Advanced Tests.

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SHOULD THERE BE LEGISLATION TO REGULATE TESTING?

Thomas Redmon
Assistant Director
The College Board
Southern Regional Office
Atlanta, Georgia

Paper presented at the Florida Association of Institutional Research,
Tallahassee, Florida, Friday, June 13, 1980

SHOULD THERE BE LEGISLATION TO REGULATE TESTING?

Thomas Redmon
Assistant Director
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Introduction

More than at any other time in the history of education, tests of all types, sizes and purposes are receiving close public scrutiny. The most visable attack focuses on national tests for admission into college. It is the purpose of this selected group of background documents to provide an important base for a discussion of the timely and critical issue of legislation to regulate testing.

At this writing, (mid-June 1980) 12 states (Colorado, Connecticut, Florida, Indiana, Maryland, Minnesota, Mississippi, Missouri, Oklahoma, Rhode Island, Tennessee, and Texas) formally considered legislation to regulate testing. In each of these states, the legislation has been defeated, deferred, or withdrawn.

Legislation is currently pending in Illinois, Massachusetts, Pennsylvania, and South Carolina. Other states have legislation pending with significant reconsiderations taking place in the legislative sessions. For example, in Louisiana Senator Bares has called for a study of the need for testing legislation and has referred the bill to the Senate and Governmental Affairs Committee for further consideration. In New Jersey, a bill introduced into the Assembly would apply to tests used by colleges, universities, vocational, and professional schools, not only for the purpose of selection, but also for the broader purposes of placement and classification. In Ohio, testing legislation is still a hot subject cooled temporarily by a recess of the legislature for the summer.

At the present time, there are only two existing state laws regulating testing. In New York a formidable bill was passed and signed by the governor taking effect on January 1, 1980. Although we only have approximately five months' experience with the impact of that legislation, we already are aware of the significant impact it will have on institutions and students. Most of the other state legislative proposals have resembled this New York law which calls for major disclosure of test questions and answers for each administration in the state. The results of this short experience with the New York law have already suggested the breadth and depth of its impact on education in America.

Lois Rice, a Vice President of the College Board, indicated the extent of this impact in testimony before the Subcommittee on Elementary, Secondary, and Vocational Education on June 5, 1980. She indicates that:

> Of the 26 admissions testing programs identified by the State Commissioner of Education as having been administered in New York during 1979 -- and subject to the law's requirements -- twenty withdrew from the state altogether. Fifteen of the twenty were in the health professions such as dentistry, optometry, and the like.
>
> One of these twenty test sponsors, the Association of American Medical Colleges, sued to enjoin enforcement of the New York law. On January 21, 1980, a United States District Court granted a preliminary injunction in favor of the AAMC, citing copyright and constitutional issues of sufficient gravity to warrent suspending the two most critical sections of the statute, relating to test disclosure and the filing of statistical and research reports, until a final determination on the merits. The lawsuit is still pending; in the meantime, the Medical College Admissions Test is being administered in New York, and test takers are not entitled to a copy of the test.
>
> Three testing programs -- the Graduate Record Examination (GRE), the Law School Admissions Test (LSAT), and the Graduate Management Admission Test (GMAT) -- are complying with the New York law and have applied their New York disclosure provisions nationwide.

All have reduced the frequency of test administrations. In 1980-81, both the GRE Aptitude and the LSAT will halve the number of 1978-79 test dates for New York students; the GRE will have 10 national and 5 New York test administrations, the LSAT 5 everywhere instead of the previous 10, and, the GMAT 7 instead of 8. For 1980-81, the GMAT test fee has been raised 88 percent, from $12.50 to $23.50. The other two have not yet publicly announced what the 1980-81 fees will be, but substantial increases are a certainty.

The two major undergraduate testing sponsors, the American College Testing Program and the College Board, are also complying with the New York law, but they are not extending its provisions outside New York, and they have reduced the frequency with which their tests are administered in New York.

Specifically, with respect to the Scholastic Aptitude Test (SAT), sponsored by the College Board, the number of regular administrations in New York for 1980-81 will be seven, half the frequency of SAT administrations in 1978-79. Our special SAT administrations for handicapped students and others will only be given during limited periods. (The SAT was actually administered in New York on 269 different days in 1979, a frequency occasioned by our policy of maximum convenience to test-takers. That policy is a casualty of the New York law.)

In order to cover the extra test development and other compliance costs occasioned by the New York statute, SAT test-takers in that state now pay a $1.75 surcharge in addition to the regular test fee of $8.25. Those who wish to receive a copy of the test they took, along with the answers they gave and the correct answers, are charged $4.65 for that special service.

So far this year the SAT has been administered in March and May in New York and we do not yet have complete statistics from any administration. The January SAT was not given in New York. Thirty two thousand five hundred and six New York students took the March SAT, and as of May 30, 2,148 or 6.6 percent paid the extra $4.65 to obtain a copy of the test and the answers. The number may rise, for March test-takers have until July 14 to request test copies.

We are in the process of preparing a research program designed to help us and any interested group or legislative body gain an understanding of the characteristics of those test-takers who request copies of their tests, compared to those who do not, and to determine what use such students make of the materials they receive.

In the meantime, the chief sponsor of the 1979 New York legislation, Senator Kenneth La Valle, has introduced a number of amendments, mostly for the purpose of trying to secure the return to New York of the low-volume testing programs, and to allow special testing of handicapped students without triggering the requirement of prompt test disclosure. Although proposing to reduce the number of tests whose disclosure is required immediately, Senator La Valle's amendments increase the wasteful use of test forms by removing the disclosure exemption for College Board and other achievement tests and by requiring that even the smallest volume tests must be made public after three years.

New York Commissioner of Education, Gordon Ambach, has urged still other changes in the New York law. Citing its adverse impact on handicapped students and others in special circumstances, and the reduced frequency and higher fees affecting all test-takers, Commissioner Ambach has recommended that test disclosure be required for no more than three administrations of a given test in the course of a year. The state legislature has yet to take any action on either Senator La Valle's or Commissioner Ambach's recommendations.

There are other organizations actively reviewing the issues posed by the New York legislation -- and by its nearly identical twin, H. R. 4949. The National Academy of Science Committee on Ability Testing is near the end of a two year study, with its report likely to become available in August or September 1980. The Education Commission of the States (ECS) has been studying the subject at a staff and committee level; its Policy Council is expected to refer a set of findings and recommendations to the ECS Commissioners sometime in the near future.

The only additional law is in California. The law is similar to New York except that this law does not require the full disclosure of test questions and answers; therefore, it is the New York law that poses the serious precedent and the incident with which the College Board joined by many institutions takes exception.

Individual member institutions of the College Board have been making their admissions policies, the purposes they seek to serve, and the procedures they use, (including the part played by the SAT) open for decades. Despite the claims of critics of testing, the truth is that test scores are only one

criterion among several (school grades, teacher and counselor recommendations, extra curricular activities, interviews) that are used by college admissions officers. In further support of this claim, the American Association of Collegiate Registrars and Admissions Officers (AACRAO) and the College Board recently surveyed 26,000 colleges and universities. The results indicated that admissions officers consider test scores third or fourth in importance among all criteria for admission. A response analysis corporation of Princeton, NJ surveyed 2,000 students in 1978 and found that students agreed that admissions tests should rank third. This 1978 study further indicated that students believe the tests to be fair and that their chief value is an impartial and objective measure of a student's ability.

As one considers the legislation in New York, the proposed legislation and its opponents in the various states, in the true history of admissions testing, the overwhelming testimony indicates that the SAT has played a significant role in broadening education opportunitites for individuals from diverse backgrounds, schools, and geographic locations. Indeed, College Board tests have pioneered efforts to eliminate quotas, favoritism, traditional, social, economic, and personal bias as barriers to educational opportunity.

Technical Issues Associated with Legislation to Regulate Testing

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June 13, 1980

Even to a casual observer, two important outcomes are evident from the current legislative activity in the area of testing. First, consumers of tests are much more aware of and concerned about testing issues than they used to be Second, testing professionals have greater incentive to give serious consideration to longstanding psychometric practice. These outcomes, not only desirable individually but also complementary, should result in a dialogue between consumers and producers of tests that will enhance the use and development of tests.

Many of the new testing laws will require some change either in how tests are developed or in how and when test developers report to the public. Under these circumstances, a discussion of technical issues that may be affected by testing legislation seems especially pertinent.

As an example of legislation which has only a moderate impact on testing practice, the Dunlap Bill (California S.B. 2005) requires that copies of unsecure tests or test samples equivalent to secure tests in current use be made a matter of public record. This requirement may not necessitate chnages in traditional test development procedures. It may, however, require changes in reporting practices.

For some testing programs, compliance with the California bill might result in having sample tests, already available to test candidates, introduced as part of the public record. For other testing programs, compliance might necessitate the production of an extra test form, not for administration but for release as public information. And, for still other testing programs, a previously secure, intact test form might have to be released for the public record, thereby reducing the number of secure test forms available for administration.

Other legislation includes more stringent requirements intended to regulate test development. In particular, the issue of disclosure of all tests after use will prompt test professionals to consider changes in traditional practices. This requirement stipulates that the questions and answers for a given test form must be released to the candidate upon request, usually within thirty days of the score released date. It is this for full and public disclosure found first in the unsuccessful Maryland House Bill 1425, that is likely to bring considerable change to test development practice in the decade of the eighties.

It is important that discussions of the full and public disclosure requirement not be restricted to test developers. It is imperative that these discussions occur among the public who take or use tests. It is imperative that the "consumers" interact with the test developers. Indeed, it is much more significant that the publics who are affected by tests are now actively interested in How and Why tests are developed, how they are appropriately used, and what their limitations are than it is that there is now legislation to regulate testing.

This increased vocal public interest gives test developers an opportunity to respond to two questions. First, what technical issues must be addressed in order to accommodate full and public disclosure? Second, what mechanism can test professionals use to communicate effectively with our publics about basic and complex measurememt practices?

Some of the technical issues that arise from the requirement for full and public disclosure include equating, test administration, scoring, and score reporting. These are the areas that will be most directly affected by full and public disclosure. As such, there is merit in first reviewing the general issues concerned and then raising questions that confront test developers as well as the general questions that arise from the regulation of testing and related educational practice.

EQUATING

If one form of a test could be administered repeated without giving some examinees the undue advantage over other examinees of having seen it before, test equating would be unnecessary. The need to equate tests is a consequence of the need to have multiple versions of forms of the "same" test.

There are numerous reasons why multiple forms are necessary. In admissions testing, equal opportunity of access may require limited exposure of test forms. Candidates who have previously studied the exact test that they then take "for real" are in a very different position from those who have not previously studied the test. While we do not know the exact quantitative effect that exposure to a test form has on any individual's subsequent performance on that test form over different amounts of time and various repetitions, it is reasonable to assume that practice on a particular set of test items will increase an individual's score on the next administration.

With full and public disclosure manidated, when an individual takes a test, that test, answer key, and answer sheet are then made available to that individual upon request. Once released to the public, that particular test is no longer secure. A test form that has been made available to even one individual can no longer be administered in a testing program where security is required.

If multiple versions of the same test are needed to ensure that, at any one administration, each examinee will see the test for the first time and thus bring to the test administration no direct practice advantage, a method of making comparable the test scores from multiple vesions of a test is necessary. Equating is the process that alows us to take scores from one form of test and compare them to scores obtained from another form of the test. The question facing test professionals then becomes not whether to equate but how to equate.

Attempts to equate tests are complicated by an obvious and very fundamental property of tests. That is, even if test construction practices are designed to create equivalent sets of items for different forms of a test, the intact forms may not elicit equivalent responses from groups of examinees. These differences in group performance may indicate that either the groups were different to start with and the test forms just reveal that difference, or the groups' performances may be the same, but the test forms create differences because the forms themselves differ somewhat. And, without careful study, it is difficult to identify the "cause" of these differences in performance. For example, if one student takes Test A and another student takes Test B, and if the former gets 10 questions right while the latter gets 12 questions right, there is no way to decide on the basis of this information alone whose skills are better developed or if one test were simply easier than the other.

Test professionals must always anticipate that even though test forms are constructed to be parallel (i.e. equivalent in difficulty and content), there is always the possibility that the forms may not behave equivalently when administered either to the same or to equivalent groups. The reality of this potential variation in the difficulty of different test forms requires that test equating methods be used. Equating is simply a process for adjusting differences in test difficulty so that scores obtained on different test forms may be directly and meaningfully compared. There are several common methods of test equating used in large scale testing programs: spiraling, anchor-test equating, and item-response theory equating.

Spiraling requires that both a secure equated form-think of it as the old standard-and a new form to be equated are administered simultaneously to one group of examinees. For example, if one group of 2000 examinees sat for the Weber Test of Applied Wiggetry, half (1000) of the examinees would take the old standard secure form A. The other half would take the new form B. The assignment of test forms to examinees would be made essentially at random.

What does "random" mean in this case? It means that if one randomly samples members from a specified population, the behavior of the sample should be appropriately representative of how the entire population would behave. Similarly, if one wanted to compare the behavior of a group that had had a particular educational experience or treatment with the behavior of a group similar in every other respect except that it had not been given the treatment, random selection of some of the population into the treatment group and some into the control group would allow such direct comparisons of the average scores. Thus, random separation of a group of individuals into two or more treatments allows one to attribute any differences in behavior to differences in the treatment. The parallel for "treatments" in this illustration is the test forms in spiral equating.

In an equating study, then, a group of examinees would be separated into "treatment" groups essentially at random. Thus, one treatment group would be administered one form, (that is, the old form) of a test; another treatment group would be administered a second form (that is, the new form).

Consider 2000 examinees scheduled to take the Weber Test of Applied Wiggetry. These students were seated and tests (Forms A and B) were distributed at random. If the test forms are of equal difficulty, there should be no differences, in average test performance between the two groups. However, if there is a difference, the test forms may be contributing to that difference and adjustments need to be made so that the distribution of scores from the new form match that of the old form, thus rendering the scores reported from the new form comparable to those reported from the old one.

Anchor-test equating requires that all forms of a test have embedded within them a common set of items that will not count toward the total score. This anchor set of items, administered to different groups of examinees, is used to measure the differences in abilities of these groups. The information derived in this manner can then be used to estimate how a group would perform on a test it had not taken.

Spiral equating and anchor-test equating are easy to conceptualized and distinguish if one remembers that spiraling assumes that the different examinee groups are from one population. Thus, any differences among groups can be accounted for by differences in the test forms. Anchor-test equating assumes that

examinee represent different populations; the common feature is the anchor set of items. Any differences in performance on the anchor items indicates systematic differences among the populations; these systematic differences can be used to adjust scores on a related test.

To illustrate anchor-test equating, consider two classes of 9th grade students taking the same algebra subtest; subtest A is one part of a longer algebra test that also includes similar subtests B and C. Suppose we want to know how both classes would do on subtests B and C but do not want to administer all three parts, A, B, and C, to both classes. We can administer subtest B to one class and subtest C to the other. Having already attained both classes' scores on subtest A, we can compare their performance and use that information to predict how each class would have done on the subtest they did not take.

Thus, each examinee takes one subtest used for scoring and one subtest used for equating. The subtests are not labeled on the test. And, the examinee does not know which subtest is used for which purpose.

Another application of anchor-test equating is to adjust for any differences over time in test difficulty, when new forms are developed during that period, differences that may have been introduced by either a change in item writers or a change in the subject matter. In this situation, if a subsection of the test, an anchor -- never used for score reporting -- were administered each year to new examinees, their performance could be compared to the performance of prior examinees. This information could be then used to adjust the scores from the new part of the test used for scoring.

A variation of anchor-test anchor equating, section pre-equating requires that intact sections of a new form (usually one or two at a time) be administered as part of an existing test but not contribute to the score. Unlike anchor-test equating, where the anchor is essentially a miniature form of the entire test, section pre-equating does not require that the intact section be representative of the entire test; it need only be related. A fourth method of equating, Item-Response Theory (IRT), establishes another set of requirements. First, a group of test items must be similar in content and difficulty. Second, for all intents and purposes the test must be unspeeded (that is, most people should have at least the opportunity to attempt every item). Third, the test items must be independent (that is, an individual should be able to respond correctly to any item without that response being dependent upon another correct response). And fourth, the test must be at least 25 items long.

Since IRT equating takes data from individual items rather than from total test scores, it may be more flexible, although more demanding technically, than either spiraling or anchor-test equating. IRT enables items to be pretested, calibrated (that is, placed on an item scale), and then added to an item pool. A new form would be assembled from this calibrated item pool, thus permitting the new form to be pre-equated.

Disclosure provisions of legislation designed to regulate testing will render all test items that contribute to examinees' scores unsecure. And, the lack of secure reusable sets of items will threaten test users' abilities to draw reasonable comparisons among examinees taking different forms at different times. The issue to be determined, therefore, is the most appropriate equating method for a given testing program. Regardless of the selected method, however, a number of questions arise in the equating process.

- One issue of general concern is the availability of large test administrations suitable for any type of equating study.
- Will candidates be able to detect equating sections of a test? And, if so, will their performance change or differ in the equating section?
- Should all sections have the same timing requirement to help disguise the location of equating sections? If so, what will be the impact on equating methods based on the use of old secure forms with different time requirements?
- How many new sections can be administered at each test administration?
- What are the effects within a testing program when equating methods are changed? For example, when a program that has used spiral equating is faced with no more old secure forms, will "drift" occur in the change to anchor or IRT equating?
- And, finally, how can equating methods be explained to test takers and users?

Test Administration

If it is assumed that test equating can successfully accommodate open testing for all tests, and if it is assumed that the more forms developed of any test, the more costly each test administration will be, then test developers must be asked how they can meet the requirements of full and public disclosure and the needs of examinees by not making tests prohibitively expensive.

Minimum test disclosure is desirable to minimize the cost passed on to each examinee. This is a generally worthwhile goal in days of galloping inflation regardless of the product or service discussed. It is, however, particularly critical that the cost of admission tests be kept at a minimum so that economically disadvantaged individuals are not adversely affected. After all, standardized objective instruments have been deliberately used in the admissions process in order to equalize opportunity. Thus, test developers must strive to meet the disclosure requirements without threatening economic discrimination. This is a difficult undertaking which raises such questions as:

1) How many secure test forms already exist?
2) What will it cost to develop each new form in terms of time, staff, materials, and equipment?
3) What further adjustments will be required to develop special forms for handicapped students (for example, the blind)?
4) What further adjustments will be required for special administrations (for example, the Sabbath observer)?

Until these questions are answered for each testing program, decisions about test administrations can not be made, but one can speculate about the impact of some decisions.

For example, what are the ramifications of a decision to reduce all test administrations by, for example, 20%? One might be that testing sites for remaining administrations would have to be increased. Another might be that

sites would have to be selected that could accommodate large numbers of examinees, as well as special materials, equipment and facilities for handicapped students.

And, what are the ramifications of a decision to reduce only special administrations by 20%, for example? One might argue that since Sabbath observers represent only a very small portion of the examinee population, a reduction in number of test administrations would have the least impact here. But what about the ethical considerations? To reduce special administrations disproportionately for Sabbath observers certainly invites charges of discrimination, parallels hold for other population subgroups as well. Moreover, if the number of test administrations is reduced for any reason, accessibility of each administration will become more important; potential conflicts with major events in a given area will have to be considered.

Scoring

Test developers are, in part, responsible for effectively communicating with the publics affected by tests about traditional and innovative test development practices. And by "test development" is meant the entire process -- writing specifications, designing and piloting forms, validating, and disseminating. One part of the process, however, has been conspicuously characterized by a lack of effective communication -- score conversions. Whether trying to explain norms tables, scale scores or any other derived score, we have succeeded only in conveying to the publics served by standardized tests an illusion of mystical manipulation. Examinees may wonder why the raw score, or "number right" is not reported directly. Why is that raw score translated into a scale score, or percentile, or other derived score? A simple answer is that raw scores are seldom directly meaningful.

How can one tell whether "95" is a good score? One would first have to know "95 of how many?" Then either normative information ("how did others in the peer group do?") or criterion-referenced information ("does 95 represent mastery of a skill?") would have to be provided. Derived scores, like scale scores and percentiles, allow test-score users to interpret score information without knowing specific details about either the number of test items or the observed test characteristics of the peer group.

The lack of effective communication in this area is exacerbated by the ongoing debate between Rights - and Formula - scoring advocates. Rights scoring simply means that an examinee is given a raw score that is a simple count of the number of items correctly answered. Since no adjustment is applied for incorrect responses to items, guessing is implicitly encouraged. In contrast to Rights scoring, Formula scoring does include an adjustment for incorrect answers.

A Formula Score is computed as follows: $FS = \text{Number Right} - \frac{\text{Number of Wrong}}{\text{Options} - 1}$

Let it be clearly understood that neither type of scoring is intended to be punitive. Rights scoring reflects all correct responses whether "guessed" or "known", whereas Formula scoring is intended to yield a net score of zero for those examinees who guess randomly on every test item. For example, let us assume that a student guesses at random on an 80-item four-choice test. On the average, that student will "guess" correctly on one-fourth of 80, or 20, items. The formula score reported for that student would be zero.[1] If, on the other hand, that student does not guess or attempt to answer any items that he or she does not know, the formula score

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[1] $FS = 20 - \frac{60}{3} = 0$

student does not guess or attempt to answer any items that he or she does not know, the formula score would be twenty[2] since there would be no incorrect responses, only correct responses and omitted responses. Test directions should describe how the test is to be scored, so that the examinee knows whether guessing results in an adjustment.

Advocates of Formula scoring may argue that Rights-scored tests are less reliable than Formula-scored ones because there is no penalty for incorrect responses. Reliability is another term for consistency, and there is no reason to expect that item responses that result from random guessing should be consistent.

The differences in scores reported by Rights and Formula scoring are likely to be equivalent in examinees who do not guess. On the other hand, Rights scoring will yield, on the average, higher scores than will Formula scoring if the examinee guesses.

Advocates of Rights scoring argue that their method is easier for the examinee to understand and to implement. Furthermore, if answer sheets and test item keys are to be made available to examinees, they may find it much easier to check the score reported under a Rights system of scoring. Rights scoring advocates also suggest that Formula scoring introduces anxiety since examinees seldom understand the Formula scoring directions read at a test administration.

Another phenomenon associated with Formula scoring is negative scores. If Student A correctly answers only 10 out of 80 test items, the formula

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[2] FS = 20 - 3 = 20

score would be: $FS = 10 - \frac{70}{3} = -13.33$

Thus, individuals may earn negative scores in the Formula scoring system.

One might conclude from this discussion that Rights scoring is more desirable than Formula scoring, but the complexity of the issue hinges on the potential impact of any change in the scoring system on the integrity or stability of the measuring scale over forms. In other words, how will a change in the scoring system affect an equating system that has been successfully used over several years? And, can old forms, initially administered under different scoring procedures, be equitably administered under new directions? To the extent that Rights scoring encourages guessing by not penalizing incorrect responses, and Formula scoring discourages guesses, it seems clear that applying Rights directions to an old Formula form would result in higher average scores -- that is, positive scale drift. On the other hand, different scoring practices may cause examinees to adopt different test-taking strategies. In this case, how much and what kind of advance publicity should be planned to help examinees adjust their test-taking behavior? Or, across different testing programs, what are the consequences of one testing program using one type of scoring procedure and another program a different type of scoring procedure?

Reporting to Examinees

The legislative requirement that test producers release to examinees their answer sheets, test items, and key for all items that contribute to the total test score offers test professionals an excellent opportunity to educate the public about measurement. After all, of the millions of examinees

who take admissions tests, for example, how many read technical manuals, attend measurement conferences, and the like? Here, then, is an opportuntiy to introduce basic measurement concepts to an audience with vested and personal interests. The challenge we face is how to explain these concepts simply and accurately. The score-reporting process can serve as one of the most direct and immediate vehicles for this massive and necessary educational effort, an effort that can be enhanced if we anticipate the kinds of questions an examinee might ask. For example:

1) Is this score correct? Were scoring errors made?
2) What does the score mean about my skills?
3) What does the score mean about my chances of being admitted into _____ University?
4) What is the appropriate use of this test score by admissions officers?
5) What are some questions I might ask of users of my score to be sure that it's used appropriately?
6) Is my performance likely to increase if I sit for the exam again? Is my performance likely to increase if I study?
7) What does this test have to do with how well I will do on the job or in school?

In summary, legislation to regulate testing and the resolution of technical issues which arise from this legislation require continued dialogue between test developers and test users. The issues discussed here and the questions raised represent only a small portion of the concerns which will arise from this dialogue. It is clear, however, that legislation to regulate testing will have a direct effect on educational practice and not only on testing practice. Thus, it is the responsibility of education to understand the implications of legislation to regulate testing.

An ACT Viewpoint on Testing Legislation

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June 13, 1980

An ACT Viewpoint on Testing Legislation

We at ACT feel that the enactment of any law should be preceded by gathering of data that document the need for legislative action. Convincing evidence should be established that the law will contribute to a solution of the problem it addresses without introducing new and equally significant problems. We lament the fact that the discussion and debate preceding the testing legislation enacted and considered to date has not met either of these criteria.

My primary purposes are (1) to identify and discuss some of the issues raised in the debate about testing legislation, and (2) to provide information related to several of the major issues that ACT believes deserve further study before additional legislation is enacted.

Specific Issues in the Debates on Testing Legislation

The specific provisions of bills on standardized testing are usually preceded by a general statement of purposes for the bill. The purposes advanced are laudable and they deserve the support of every test sponsor and user. Even though most sponsors endorse and observe the Standards for Educational and Psychological Tests published by the American Psychological Association, the tests themselves as well as the practices employed in their use are imperfect and subject to improvement.

Over the years, ACT has strived to implement procedures and practices that advance the purpose identified in legislative preambles. The development of the ACT Assessment Program into a comprehensive information service that is useful in a variety of admissions-related activities, and the extensive support materials and services aimed at effecting good uses of the Program are evidence of this fact. These advances and improvement in the ACT Assessment Program have been the result of continuing efforts to be responsive to evolving needs of students and colleges. No legislation has been required to give impetus to these changes.

In contrast to the diversity in purpose and utility of the Assessment Program, the assumption implied in the legislation is that college entrance tests serve the single purpose of selection. By failing to recognize this diversity, the legislation overlooks the complexity of issues it encompasses and it serves to force standardization of both the tests and their uses.

An unfortunate characteristic of the debate about testing legislation is that the alternative positions on the issues are frequently cast in absolute terms. By way of example, I would like to explore some of the positions taken by proponents and opponents of the legislation.

Proponents of testing legislation argue that admissions tests have significant and inappropriate influence upon individual's access to higher education and thus to job opportunities; but opponents point to evidence that nearly all students who apply to college are successful both in gaining admissions and that the vast majority enroll in the college of their first choice.

Proponents of testing legislation argue that admissions tests are culturally biased and cite as evidence the positive relationship between income level and performance on the tests; but opponents report data which show that various non-test variables (e.g., high school grades) are also positively related to family income level, and that both of these relationships simply reaffirm the well-documented influence of environment (including socio-economic status) on educational development.

Proponents of testing legislation claim that the admissions tests are either invalid or inadequate and that other student characteristics and qualities should be given much more weight in decisions affecting students; but opponents bring forth a vast body of data which indicate that admissions tests are highly valid for their intended uses, that few, if any, colleges rely solely on test data in their admissions decisions, and that many of the alternative sources of relevant information are notoriously unreliable and invalid at present.

Proponents of the testing legislation speak as though all admissions tests serve the single purpose of selection; but opponents emphasize the predominant non-exclusionary type uses (e.g. academic advising and placement) of some of the tests and point to strong evidence indicating that test data are seldom the sole determining factor in selection decisions, when such decisions are necessary.

Proponents of testing legislation express concern that test results are given too much attention and emphasis by the public and the press and that the test data are too often overinterpreted (e.g., witness the recent test score decline and the accompanying accusations that the schools are not doing their jobs); but opponents direct attention to the significant value of using the test results in appropriate and positive ways pertinent to the public interest and the major efforts already put forth by the test sponsors to encourage and educate consumers in appropriate uses of the test data.

Proponents of testing legislation claim that the testing organizations, especially the non-profit agencies, are unaccountable to the publics they serve; but opponents ask for substantive evidence that such misuses abound, and they argue that proponents support such misuses by facilitating uses of the tests for which the tests were not designed (e.g., the disclosure of test contents on the grounds that students will be able to study the tests and "learn from them").

Proponents of testing legislation question the adequacy of the admissions tests for assessing the comprehensive body of knowledge and skills imparted by the schools; but opponents point out that (1) the admissions tests are not designed to be comprehensive of all learning, (2) the tests do measure knowledge and skills appropriate to the uses made of them, and (3) test data gathered over a long period of time indicate that many students are not acquiring even those basic skills that the tests do assess.

Proponents of testing legislation imply that the national admissions tests are technically substandard; but opponents hold that these tests are the most carefully constructed, thoroughly researched and publicly documented assessment instruments ever developed and used, and that one reason the national programs were developed was that the locally-developed testing programs which preceded them often lacked the resources required to assure the required technical quality of instruments used in the college admissions process.

These differing perspectives serve to illustrate the variety and complexity of the issues involved in testing legislation and why we believe thorough study is needed before legislation is enacted.

The Test Disclosure Provision

ACT believes that most of the provisions of the Florida legislation are already satisfied by the existing practices of the admissions testing sponsors. A major exception is the requirement of some of the legislation that a copy of the test form and a copy of the student's answer sheet be released to the student after each test session. Because disclosure is called for in much of the legislation and because its impact is so significant, I would like to identify and discuss some of the arguments put forth by its advocates.

"Students can monitor test scoring accuracy by viewing questions and their corresponding correct responses." There is little doubt that the release provision can serve this purpose. The question is how great the need for such extra verification is and whether there are other more efficient ways of resolving it. In the case of the ACT Assessment program, the scoring accuracy over the years has been extremely high, and we have been pleased to respond to requests for manual rescoring in cases where machine-scored results have been questioned. If these procedures do not suffice, auditing of the scoring system and process by an independent third party presents another alternative widely used in similar situations.

"The public can scrutinize the contents of examinations to ascertain qualitative information, and to examine content for bias and fairness." The ACT tests are developed with the assistance of curriuclum experts from all over the United States and reviewed by minority members. They are also made available to qualified researchers for study and evaluations. Year-to-year changes in test design, content areas covered, level of

difficulty and other key test characteristics are deliberately kept to a minimum. Accordingly, the questions which again must be asked in this age of inflation is: Cannot the purpose identified be very adequately served by release of random editions of recent but non-current test forms? The difference in cost between the two methods is very significant, while the difference in effect is minuscule.

"Students can learn from seeing what they missed on an examination and knowing the correct answer(s)." This is undoubtedly the case. The important question is: How much can they learn and to what end? It is unlikely that students will learn much of value by reviewing the tests. Most tests covered by this legislation sample academic disciplines and domains, only to the extent appropriate to the uses for which they were designed. They are not sufficiently comprehensive to allow for in-depth diagnosis of educational shortcomings because they are not designed for that purpose.

In addition, there is one potentially serious disadvantage to test disclosure and it is that schools and teachers will be tempted to teach for the tests and some will succumb to the temptation because they will feel duty-bound to provide their students with the best opportunity of performing well. They will also be tempted to teach for the tests to demonstrate the success of their own efforts.

Teaching for the specific items included in a test would erode the validities of the tests over time. A related outcome may be that the tests will begin to control the curriculum. We believe that the curriculum should determine the content of the tests rather than the reverse.

Summary

Educators and educational institutions are more likely to be successful in serving society if they make informed decisions about the educational process, whether about individual students or programs affecting those students. Likewise, students are more likely to achieve their fullest potential if they are well informed about their current capabilities in relation to the requirement of various educational and vocational programs they may be considering. The ACT tests are designed to accommodate such informed decision making. Indeed the value of the tests to students and educators in this context far exceed any possible value of them in the selection decisions attributed to them. Given these uses, it is indeed lamentable that they should be subject to legislation which can only diminish their availability and value without corresponding gains in benefits. This is the primary reason that has motivated ACT to oppose the legislation proposed and enacted to date. We will continue in our resolve to oppose the legislation on these grounds.

Some Facts About the Predictive Validity of the ACT Assessment

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Some Facts About the Predictive Validity of the ACT Assessment

Several uses of the ACT Assessment require that its measures of general educational development be related to students' academic performance in college. The accuracy with which these measures can predict college grades is called their predictive validity. The purpose of this paper is to highlight some facts about the predictive validity of the ACT Assessment. The paper will present evidence to support nine conclusions about the Assessment Program. A more comprehensive discussion of the research supporting these facts and of issues surrounding predictive validity can be found in ACT Research Report No. 81, "The Predictive Validity of the ACT Assessment."

1. The measures of general educational development obtained through the ACT Assessment are accurate predictors of college freshman grades.

Evidence: ACT provides to colleges research services for predicting college freshman grades from ACT test scores and high school grades. For the typical college participating in ACT's predictive research services, about 88% of the predicted freshman grade averages are within one grade unit of the actual freshman grade averages; about 57% of the predicted grade averages are within .5 grade units of the actual grade averages; and about 24% are within .2 grade units of the actual grade averages. For the typical college, the mean absolute error of prediction is .55 grade units, and the cross-validated correlation is .56.

These data indicate that while predictions based on ACT test scores are not perfect, they are accurate enough to be useful for counseling, placement, sectioning, and selection, and that they are certainly far better than not using any objective methods of prediction. To minimize the possibility of making incorrect educational decisions, ACT encourages students and counselors to take into account any special, individual characteristics which are not measured by the test scores and high school grades, but which could affect a student's performance in college.

2. ACT test scores are as effective in predicting freshman grade average as self-reported high school grades.

Evidence: ACT recently studied the accuracy of grade predictions at 205 colleges which use its predictive research services with the following results:

a. The median college mean absolute error for predicting freshman grade average was .55 grade units when the predictions were based on ACT test scores and .60 grade units when based on high school grades.

b) The median college cross-validated correlations were .48 for test scores and .49 for high school grades.

Thus, test scores were typically somewhat better predictors than high school grades when judged by their mean absolute errors of prediction, but were slightly less accurate than high school grades when judged by their cross-validated correlations. In both cases, however, the differences in prediction accuracy are not large enough to be practically significant.

3. Self-reported high school grades are almost as effective as school-reported high school average in predicting freshman grade average.

Evidence: Because the high school grades used by ACT to make predictions are self-reported and cover only four subject areas, they are potentially less effective predictors than overall high school grade average as reported by the high school. The evidence to date, however, indicates that there is not much difference in the predictive validity of these two measures. Table 5.17 of the Technical Report for the ACT Assessment (p.133) is based on data from 17,722 students. It indicates that the typical multiple correlation for self-reported high school grades with freshman grade average was .575, while the typical mutliple correlation for predictions based on school-reported overall grade average was .581, a difference of .006.

Moreover, studies done by ACT in the early seventies revealed a strong association between school-reported and self-reported grades (Maxey and Ormsby, 1971). According to these studies, about 78% of all high school students report their grades to within one grade of that reported by the high schools. ACT is presently updating this research.

4. Using both test scores and self-reported high school grades in predicting college freshman grade average results in greater accuracy than using either alone.

Evidence: In a recent ACT study, the median college mean absolute error for predictions based on high school grades was only .60 grade units; while it was .52 grade units when the predictions were based on both test scores and high school grades. Thus, adding test scores to a prediction equation based on high school grades reduced the mean absolute error, on the average, by .08 grades units, i.e., by about 13%.

A similar result was true of the cross-validated correlations. The median college cross-validated correlation for predictions based on high school grades only was .49. For predictions based on both test scores and high school grades, the median college cross-validated correlation was .56.

5. ACT test scores and high school grades are useful predictors of grades in specific freshman courses. The accuracy of these specific course predictions is only slightly less than that of overall grade average predictions.

Evidence: Grades in specific freshman courses tend to be more erratic statistically than overall grade averages. The greater instability in specific course grades is probably due to two reasons. First, a specific course grade is based on fewer measures than is the overall grade average. Second, a specific course grade is more susceptible to the grading idiosyncracies of a particular instructor. As a result, overall grade average can usually be predicted somewhat more accurately than specific course grades.

This tendency is reflected in the multiple correlations of high school grades and ACT test scores with grades in specific college courses. Among colleges that used high school grades and ACT test scores to predict grades in English during 1976-77, 1977-78, and 1978-79, for example, the median multiple correlation was .52. For predicting college mathematics grades, the median correlation was .53; for predicting social studies grades, it was .57; and for predicting natural science grades, it was .57; and for predicting natural science grades, it was .58. All these correlations are somewhat smaller than the median multiple correlation of .59 for predicting overall grade average. The differences are not large enough, on the average, however, to be of much practical importance.

It should be noted that all four high school grades and all four test scores are used to predict specific course grades. Therefore, the smaller correlations are not caused by restricting the amount of predictive information (such as would occur if only the high school English grade and the ACT English score were used to predict college English grades).

6. The predictive validity of ACT test scores and self-reported high school grades can differ significantly from one college to another.

Evidence: In a recent study of 205 colleges that used the ACT predictive research services, the mean absolute error for predicting freshman grade average from ACT test scores and self-reported high school grades was computed. For some colleges, the grade predictions were quite accurate, with mean absolute errors in the range of .30-.40 grade units. For a few colleges, however, the grade predictions were much less accurate, with mean absolute errors in the range .80-.90 grade units. For 81% of the colleges, mean absolute errors in the range .40-.70 grade units were observed.

Thus, although a few colleges have grade prediction accuracy that deviated significantly from the median, the large majority have prediction accuracy that is suitable for guidance, placement and selection decisions.

7. ACT test scores and self-reported high school grades are useful predictors of freshman grade average for both males and females. The predictions for females are somewhat more accurate than those for males.

Evidence: In a recent study of 205 colleges that use the ACT predictive research services, the predictive accuracy of total group (combined-sex) prediction equations was determined separately for males and females. The median college mean absolute error in predicting the freshman grade averages of females was .50 grade units, as compared to .56 grade units for males. The median college cross-validated correlation for females was .60, as compared to .53 for males. In typical colleges, about 25% of the grade predictions for females were within .20 grade units of their actual grade averages, as compared to 23% of the grade predictions for males. Thus, the predictions for females were more accurate than those of males as measured by all three statistics. The differences, however, are not large enough to be practically important.

8. ACT test scores and self-reported high school grades are accurate predictors of freshman grade average for whites, blacks, and Chicanos. The predictions for whites are somewhat more accurate than for blacks and Chicanos.

Evidence: ACT has recently conducted a study of the predictive validity of the ACT Assessment for selected racial/ethnic groups. The three racial/ethnic categories to be used are those indicated by students in Item 65 of the Student Profile Section of the ACT Assessment.

Using a total group equation for each college resulted in a mean absolute error of .53 grade units for whites, as compared to .59 grade units for both blacks and Chicanos. The proportion of students for whom predictions were accurate to within .20 grade units varied from 21% for blacks to 25% for whites. The median cross-validated correlation was nearly the same for Chicanos as for whites (.56) but was somewhat lower for blacks (.48).

On the average, blacks were predicted to have higher grade averages than they actually received (by .05 grade units). The grade averages for whites also tended to be over-predicted (by an average of .02 grade units), but the grade averages of Chicanos were neither under- nor over-predicted, on the average. The magnitude of the over-predictions for blacks and Chicanos is not large enough to be of practical significance.

These results indicate that ACT test scores and self-reported high school grades are useful in making predictions for all three groups, but that they are somewhat more accurate for whites.

9. ACT test scores and self-reported high school grades are useful predictors of freshman grade average for handicapped as well as for non-handicapped students. The predictions for non-handicapped students are somewhat more accurate than for handicapped students.

Evidence: In 1978 ACT compared the accuracy of grade predictions for handicapped students with those of non-handicapped students. The handicapped students were those who identified themselves as such on Item 6 of the Student Profile Section. The resulting cross-validated correlation was .59 for both groups.

ACT has conducted a follow-up study based on the 1978-79 freshman grades of about 231,000 students at 550 colleges. The results indicate that the mean absolute error of prediction for handicapped students was .59 grade units, compared to .55 grade units for non-handicapped students. The cross-validated correlation was .54 for handicapped students, compared to .57 for non-handicapped students. On the average handicapped students were predicted to receive slightly higher grade averages that they did (by .02 grade units), and non-handicapped students were predicted to receive slightly lower grade averages than they did (by .01 grade units).

These results indicate that grade predictions for non-handicapped students are slightly more accurate on the average than those for handicapped students, but the differences are not large enough to be of practical significance. Because the studies included many individuals whose handicaps would have little influence on their abilities to perform on the test, the results cannot be extended to persons with severe handicaps (e.g., blindness) as specific cases.

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Editor's Note:

At the end of 1980, Thomas Redmon provided an update from which the following summary was taken.

During 1979 and 1980, state and federal legislation designed to regulate standardized tests, such as the Scholastic Aptitude Test (SAT), has been a major concern of the College Board. New York State is still the only state that has passed a law mandating public disclosure of standardized admissions tests, the most controversial provision of most testing legislation. This provision requires the public disclosure of test questions and answers after a test administration, a practice that precludes test reuse. California in 1978 enacted a law requiring public filing of information about standardized admissions tests, but not test disclosure.

During 1980, the public debate over the need for admissions test disclosure legislation spread to 17 states in which legislation was formally introduced. However none of the proposed legislation--most of which was modeled after the New York law--was enacted. Legislation was introduced in 1980 but defeated, withdrawn, or deferred in Connecticut, Florida, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, New Jersey, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, and Tennessee. Only in New Jersey will legislation introduced in 1980 be carried over automatically to the 1981 legislative session.

At the national level, Congress postponed action on a bill requiring test disclosure sponsored by a New York congressman after conducting extensive subcommittee hearings during 1979 and 1980.

Based on the March, May, and June 1980 administrations of the SAT in New York, there is very little demand for test disclosure information. Furthermore, the profile of individuals requesting disclosure information illustrates that it is the already advantaged student, from an upper income bracket family, who achieves well academically, who is most likely to be served by the law. As College Board President George Hanford reported to the Board of Trustees in September, less than 5 percent of the approximately 118,000 students who took the SAT in New York between March and June 1980, requested test disclosure information. Similar low demand for disclosure information was experienced during the fall of 1980.

A comparison of New York SAT-takers requesting and not requesting disclosure information by family income indicates that one-fourth of the students who requested test disclosure information reported a family income of $50,000 or more while only one-tenth of all other students did so. Disclosure requesters also were twice as likely as non-requesters to be in the top tenth of their class and to have a high school grade point average of 3.5 or better. Additionally, disclosure requesters tended to have averaged more years of study in all high school academic subjects and to have scored significantly higher on the SAT than students not requesting disclosure information. Finally, traditionally disadvantaged students, especially blacks and Hispanics, were grossly under-represented among disclosure requesters.

Even though some of the long-term adverse impact of the legislation has yet to be confirmed, the initial negative effects of the New York law are evident.

Fewer testing programs were available to students in New York from January to June 1980. Originally 20 to 26 postsecondary test programs were withdrawn from the state. However, amendments to the law exempting some tests from coverage have resulted in reinstatement of some of these programs.

Almost all test sponsors reduced the frequency of test administrations in New York. There has been a substantial decrease in the number of SAT test dates available to students. During 1980-81, only four Saturday and four Sunday test dates are available instead of the normal seven of each in New York.

There has been an increase in the fee for the SAT. A $1.75 surcharge has been added to the regular SAT fee. For the optional test disclosure service the fee is $4.65.

The law is being challenged on constitutional grounds in federal court by the Association of American Medical Colleges.

Florida Institutional Research Conferences: Program Chair and Host(s)

Lakeland	(1)	1968	Pete Tully	Richard Burnette
Miami	(2)	1969	Jim Wattenbarger	Matt Steele and Gus Wenzel
St. Petersburg	(3)	1970	Richard Burnette	Edward Stevens
Winter Park	(4)	1971	Richard Whitehead	Norris Miner
Gainesville	(5)	1972	John Nickens	Joe Stafford
Tampa	(6)	1973	Archie Johnston	Dennis Goodwin
Jacksonville	(7)	1974	Hiram Smith	Jeff Stackman
West Palm Beach	(8)	1975	Jim Howell	Mildred Whatley
Orlando	(9)	1976	Dan Coleman	Norris Miner and Jim Talmadge
Clearwater	(10)	1977	Don Anderson	Ed Cottrell and Carol Rolf
Winter Park	(11)	1978	Norris Miner	Jim Talmadge
Fort Myers	(12)	1979	Sue Legg	Russ Peeples
Tallahassee	(13)	1980	Dave Montgomery	Archie Johnston

Registrations in the Thirteenth Annual Florida Statewide Conference on Institutional Research

1. Alghogaily, Ibrahim
   Florida State University
2. Bell, Wally
   Department of Education
3. Burch, Ivie R.
   Gulf Coast Community College
4. Christal, Melodie E.
   State University System
5. Chulak, Jean
   Florida State University
6. Clark, Richard
   St. Johns Community College
7. Clements, David G.
   University of Georgia
8. Coleman, D. R.
   University of Central Florida
9. Cox, Samuel C.
   Seminole Community College
10. Duckwall, Julia
    Florida State University
11. Estrano, Alfredo
    Florida State University
12. Fordyce, Joseph
    University of Florida
13. Fox, Dallas
    University of Florida
14. Fulcher, Terry
    State University System
15. Gmuer, Rosanne
    Hillsborough Community College
16. Green, Jr., Hiram
    Department of Education
17. Haynes, Jr., Felix T.
    Daytona Beach Community College
18. Hector, Henry
    State University System
19. Hill, Fran T.
    University of South Florida
20. Jackson, William H.
    Central Florida Community College
21. Johnson, Craig
    Florida State University
22. Johnston, Archie
    Tallahassee, Community College
23. Jordan, Shirley M.
    St. Johns Community College
24. Lawton, Robert E.
    Brevard Community College
25. Legg, Sue M.
    University of Florida
26. Lightfield, Tim
    Florida Junior College at Jacksonville
27. Losak, John
    Miami Dade Community College
28. Lott, Gary B.
    Board of Regents
29. Maxey, James
    ACT - Iowa City, Iowa
30. Mehallis, Martha
    Broward Community College
31. Mitchell, Bruce D.
    State University System
32. Mizell, Al
    NOVA University
33. Montgomery, David C.
    State University System

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34. Noriega, Penny
Hillsborough Community College

35. Patel, Ranaja
Bethune-Cookman College

36. Peeples, Russell C.
Edison Community College

37. Rudy, Harry
Division of Community Colleges

38. Ruth, Jr., Lester R.
Lake-Sumter Community College

39. Stuckman, Jeffrey
Florida Junior College

40. Talmadge, James T.
Seminole Community College

41. Thomes, Shirley M.
University of South Florida

42. Tilton, Betty
Florida State University

43. Tully, G. Emerson
American College Testing Program

44. Tully, Thomas
Hillsborough Community College

45. Turrisi, Ilona
Florida State University

46. Vandiver, Robert S.
Embry-Riddle Aeronautical University

47. Webb, Jeaninne
University of Florida

THIRTEENTH
ANNUAL FLORIDA STATEWIDE CONFERENCE
on
INSTITUTIONAL RESEARCH

Downtown Holiday Inn June 11-13, 1980 Tallahassee, Florida

Expectations for Quality: Should they be satisfied or questioned?

June 11, Wednesday

5:00 to 6:00 p.m. - Registration
5:30 to 6:30 p.m. - Social Hour - Host: Pete Tully, ACT
Hospitality Room (see bulletin board)

June 12, Thursday

8:00 a.m. - Registration
8:30 a.m. - *Opening and Greetings* * Joe Stafford, Vice Chancellor, Planning and Budgeting, SUS
8:45 a.m. - *Legislative Update* Bill Law, Staff Director, House Higher Education Committee

9:45 or 10:00 a.m. - Coffee Break
10:30 a.m. - *Data Bases: Compatible or Combatible*

There has been increasing consideration of a uniform data base for all of Florida's Higher Education. What are the pluses and minuses? Are there alternative means to satisfy the objectives?

Chair: Bill Law
Bill Odom, Staff, Senate Ways and Means Committee
Jim Morgan, Director, Management Information Services, SUS
Dallas Fox, Associate Director, Planning and Analysis, UF
John Losak, Dean, Institutional Research, Miami-Dade Community College

Noon - Lunch on your own

*Also Marm Harris, President, Tallahassee Community College

1:30 p.m. - *The Community Colleges' Accounting for Quality*

How does the Community College Coordinating Board want to demonstrate quality? What are the uses of the information which results from being accountable?

Chair: Myron Blee, Bureau Chief, Program Support and Services, Division of Community Colleges
Richard Bedics, Director, Instructional Services, Pensacola Junior College
Mantha Mehallis, Director, Institutional Research and Planning, Broward Community College

2:45 or 3:00 p.m. - Coffee Break
3:30 p.m. - *Program Budgeting Revisited*

If the base for funding shifts from enrollment to program, what does it mean for the institution and for institutional research?

Chair: Gary Lott, Coordinator, Academic Programs, SUS
Pat Barrett, Staff, House Appropriations Committee
Albert Hartley, Vice President for Administration and Finance, USF
Bill Shade, Senior Governmental Analyst, Office of the Governor

6:00 p.m. - Social Hour - Host: Craig Johnson, FSU
Hospitality Room (see bulletin board)
7:00 p.m. - Banquet
Speaker: W. Cecil Golden, Associate Deputy Commissioner, Department of Education

June 13, Friday

7:15 a.m. - Planning Breakfast (Inn Restaurant)
8:00 a.m. - Registration
8:30 a.m. - *Contributed Papers*

Chair: Bruce Mitchell, Coordinator, Planning and Analysis, SUS

(1) Microcomputers: A catalyst for the identification of quality instruction

Al P. Mizell, Director of Curriculum Design, Nova University

(2) A proposed taxonomy of educational benefits

Lester R. Ruth, Jr., Director, Planning and Research, Lake-Sumter Community College

9:15 a.m. - *Essential Academic Skills*, a status report

Margaret Maney, Director, Essential Academic Skills Project, DOE

10:00 or 10:15 a.m. - Coffee Break

10:45 a.m. - *Trends in Truth in Testing*

Are standardized tests valid enough? Are students benefitting as much as they should?

Chair: Melodie Christal, Coordinator, Planning and Analysis, SUS
Thomas Redmon, Assistant Director, The College Board
Margaret Weber, Professional Associate, Educational Testing Service
*Gerald Sanchez, Director, University of Florida Students for Legislative Action
Jim Carr, Regional Director, American College Testing

Conference Program Chairman: Dave Montgomery, Director, Planning and Analysis, SUS

Local Host: Archie Johnston, Director, Institutional Research, Tallahassee Community College

*Schedule conflict required cancellation.
Added to panel: James Maxey